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Railroading's rich *legacy of speed*

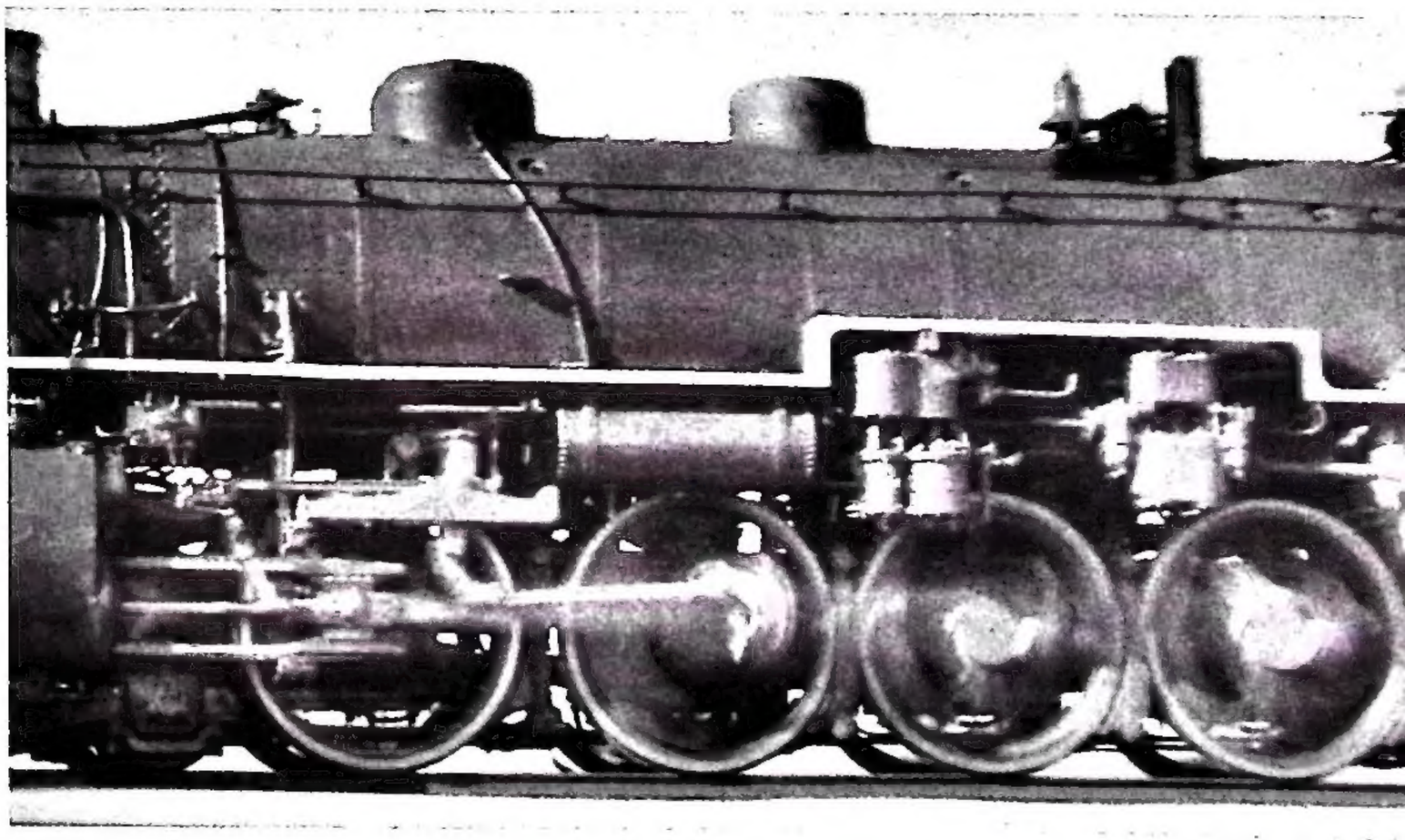
Nowadays, we think nothing of routinely driving our cars at 60 or 70 mph; any trains we might see from our speeding autos are likely to be going much slower. It's easy to forget, then, that trains were once the fastest things on Earth, the very symbols of speed.

Steam trains took on the mantle of speed almost from their inception. By the end of the 19th century, as the first "horseless carriages" were puttering tentatively around, trains were reaching 100 mph. In the 1930's, autos had evolved into fast machines but lacked a high-speed highway system on which to operate—and streamlined trains captured national attention with breathtaking feats of speed and endurance.

Yes, speed was an essential characteristic of railroading, and not just because of the technology's capacity for offering rapid transportation to the public. The very way railroads were operated, a system based on trains being at specified places at specified times, engendered a culture of haste in the never-ending quest to be "on-time."

As high-speed rail becomes an ever-more attractive alternative to crowded highways and airways, America's fastest trains are undoubtably in the future. But as trains demonstrate their continuing ability to shrink time and distance, it's worth reflecting on railroading's rich legacy of speed.

Robert S. McGonigal



The blurred running gear of Canadian National 4-8-4 No. 6029 speaks of speed with an eloquence no other form of transportation can match.

D. L. McQUEEN

ClassicTrains
SPECIAL EDITION NO.7

FAST TRAINS

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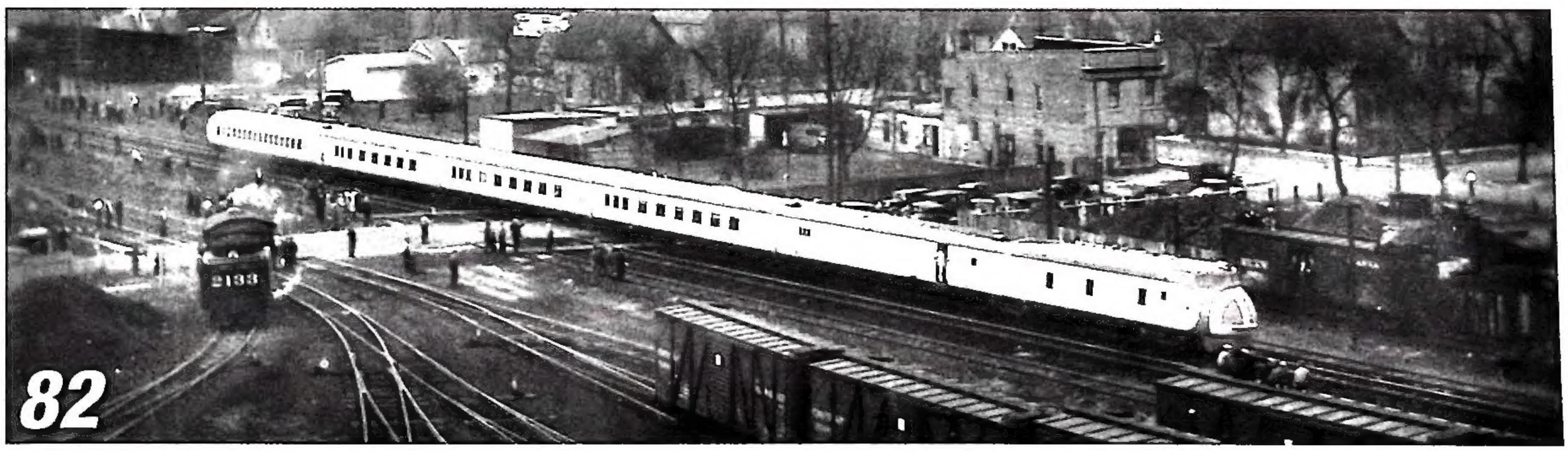

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Contributors

MICHAEL W. BLASZAK ["Speed, Signals, and Safety," pages 38–47], a Chicago attorney, represented the Santa Fe in its application to the FRA for authority to discontinue the ATS system over two line segments in Southern California in 1984. He has written extensively for TRAINS magazine and other railroad publications for many years, but this is his first byline in a CLASSIC TRAINS publication.

NEIL CARLSON ["Hudsons: Powerful Passenger Speedsters," pages 50–60], who grew up in Buffalo, N.Y., in the 1950's, has had a lifetime fascination with steam power, sparked by boyhood visits to the local Nickel Plate Road roundhouse. When NKP dieselized in 1958, he refocused on Ontario, where Canadian National and Canadian Pacific both ran steam for another year and a half. Neil attended college in Ohio, and after earning degrees in Electrical Engineering, he moved to California's Silicon Valley, where he worked for several high-tech firms. Now retired, he lives in Reno, Nev. This is his fourth article in a CLASSIC TRAINS publication.

JACK O. ELWOOD ["Introducing the World's Fastest Freight Train, Santa Fe's Super C," pages 28–35], a retired Santa Fe engineman who lives in Fresno, Calif., has had four stories in CLASSIC TRAINS since Spring 2003. This is his third byline in one of our Special Editions.

GREG GORMICK ["Pennsy's Fast Track to the Future," pages 104–111] has worked as a writer, researcher, strategic analyst, and policy adviser in the railway and transit fields since his 1978 graduation from Ryerson Polytechnical Institute's School of Journalism. Gormick's most notable public sector role was as transportation policy adviser to the mayor, city council, and economic development department of the City of Toronto. He currently serves as Canadian contributing editor of the trade magazine *Railway Age*. Greg also provides speeches, press releases, and other promotional materials for VIA Rail Canada. His book, *The Canadian: A Celebration of a Streamliner*, will be released by Boston Mills Press in 2009. This is his first article in a CT publication.

PETER A. HANSEN ["Coast to Coast in Record Time," pages 82–91] is the editor of *Railroad History*, the Railway & Locomotive Historical Society journal. This article is his 17th in a CLASSIC TRAINS publication.

KEVIN J. HOLLAND ["Banana Trains of Mid-America," pages 64–73] spent several years during the mid-1980's on the marketing staff of a major international banana firm, highlighted by sojourns in Panama, Honduras, and Costa Rica. For the past dozen years, he has been a full-time, freelance transportation writer, editor, and publications designer working out of his home near Toronto, Ont. This is Kevin's fifth article in a CLASSIC TRAINS Special Edition. He thanks Paul H. Reistrup, J. Parker Lamb, Paul Burgess, Chuck Werner of the Illinois Central Historical Society, and the Special Collections staff of Chicago's Newberry Library for their assistance.

ED KING ["Make Her Go Fast," pages 8–11] is a retired railroader and accomplished rail book and magazine author living in Florida. He has written many articles for TRAINS over the years and was a TRAINS columnist, as "The Boomer." His rail career

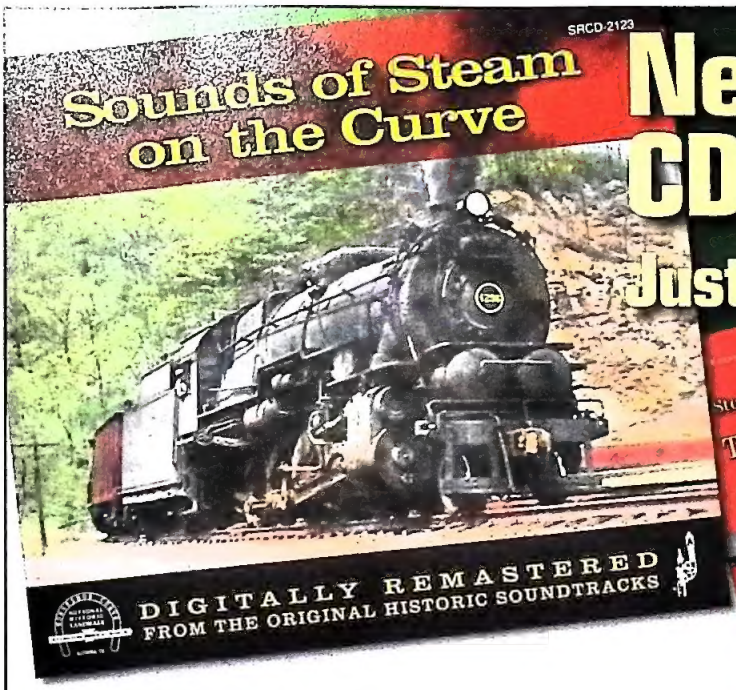
included stints with N&W, USRA, Rock Island, and Soo Line (in whose Rondout, Ill., tower he is pictured). This is his ninth byline in a CLASSIC TRAINS publication.

WILLIAM R. "BILL" KUEBLER JR. ["Who Gets to Fargo First?" pages 94–100] grew up in Fargo. His ride in this story was one of many he made, beginning at age 9, in the mid-1960's, courtesy of train and engine crews. He accumulated over 20,000 miles by age 13 and once rode the cab on the *North Coast Limited* to Billings and back, 1,250 miles over six engine districts,

possibly a record for a non-employee. Bill pursued aviation for a career, graduating from the U.S. Air Force Academy in 1979. After eight years in the Air Force, he now flies Boeing 767's for American Airlines. He has been heavily involved with the Northern Pacific Railway Historical Association since its beginning in 1983. Bill, who has authored two NP books, lives in Apple Valley, Minn., with his wife and two sons. He wrote two sidebars in our 2003 DREAM TRAINS issue, but his is his first feature.

E. MICHAEL "MIKE" MARTIN ["A Strong Closing Performance," pages 76–79] grew up in Wilmette, Ill. As the son of Eldon Martin, General Counsel of the CB&Q, Mike traveled a lot on the Burlington as a youth, a "dream life for a high-school-age rail nut." He earned a degree in economics in 1962 from the University of Michigan, having worked summers for CB&Q and Burlington Truck Lines; he also was a redcap in Chicago Union Station. Not wanting to work for CB&Q while his father did, Mike joined Great Northern in 1962, and held several operating positions. After the 1970 BN merger, he was trainmaster in several locations, then division superintendent at Glendive, Lincoln, and Denver. He concluded a 33-year career in 1995, retiring upon the BNSF merger. Mike lives in Keller, Texas; this is his first story in a CT title.

JOE WELSH ["The Great Chicago–Twin Cities Speed War," pages 14–25], is the author of numerous articles and books on passenger trains. This is the ninth byline in CLASSIC TRAINS or one of its Special Editions for Joe, who lives in Auburn, Wash. ■



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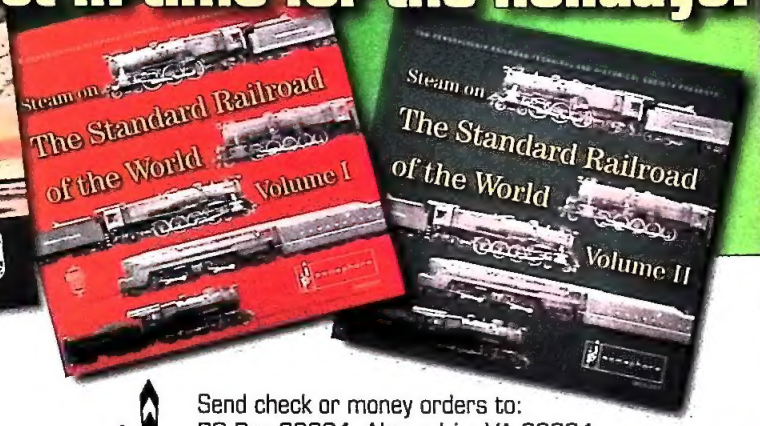

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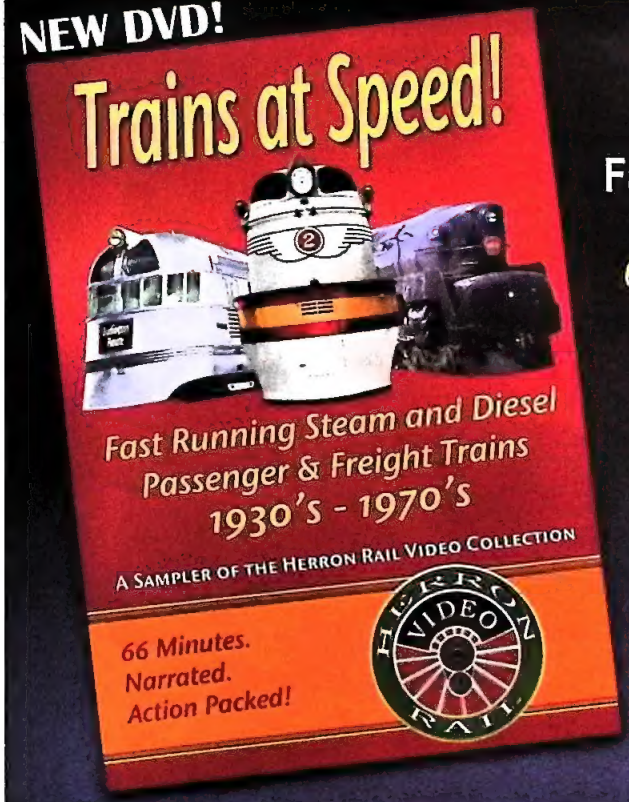

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‘Make her go fast’

Speed was once part of railroading’s soul

BY **ED KING**

It's hard for us to believe, here in 2008 when communications are instantaneous, that for countless thousands of years people and goods could move only at the speed of a running man or, later, a galloping horse. When transportation was limited in this way, it mattered little to a man what happened on the other side of the world (especially before he believed the world *had* another side). Indeed, it mattered little what happened even in the next *village* if all his needs were met where he was.

When commerce began—when people desired to use goods that were produced elsewhere, and the producers of those goods needed to distribute them for their own income—things changed. Movement of goods and people still had to rely upon quadrupeds with muscles and lungs applying power to carts and carriages, or on the seas, sailing vessels subject to the vagaries of winds and tides.

Man might have desired to go faster, but until something cataclysmic happened, he'd have to be content with moving about his world at a maximum of about 15 mph.

Beginning in the late 18th century, though, something cataclysmic did happen.

James Watt, Richard Trevithick, George Stephenson, and Robert Fulton happened.

Steam happened.

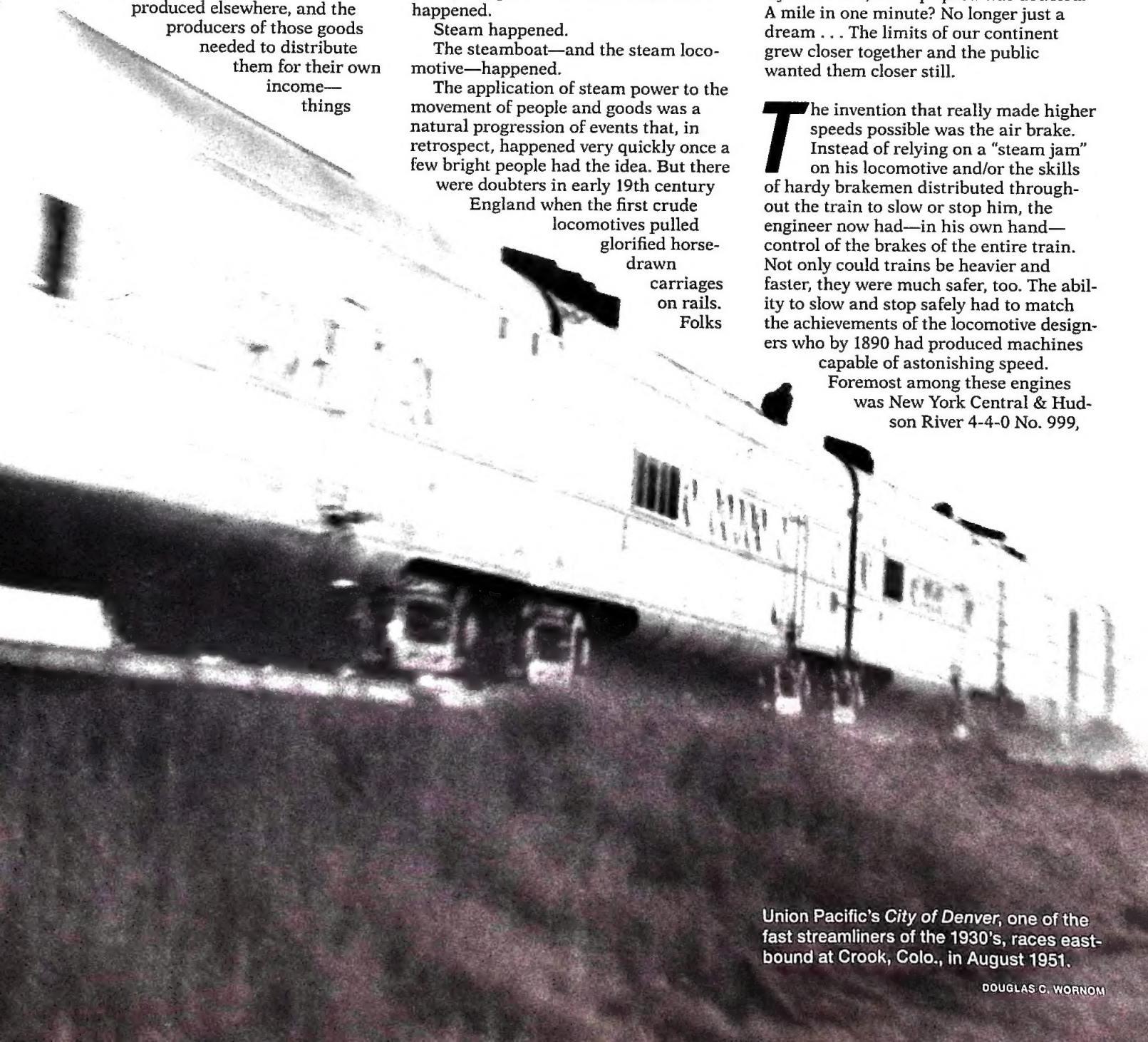
The steamboat—and the steam locomotive—happened.

The application of steam power to the movement of people and goods was a natural progression of events that, in retrospect, happened very quickly once a few bright people had the idea. But there were doubters in early 19th century England when the first crude locomotives pulled glorified horse-drawn carriages on rails. Folks wondered if the human body could withstand moving about the planet at the unheard-of rate of 20 mph. Would there be physiological or mental effects? Would we overcome gravity and fly right off the Earth to vanish in space?

These fears were dashed as the railway boom began. In the beginning, trains weren't capable of much more than that 20 mph, but rapidly developing technology of tracks, cars, and engines made possible great advances in speed. A world population formerly unable to travel rapidly now clamored for more. By 1850, U.S. passenger trains might attain speeds of 30 mph. By the 1870's, the top speed was doubled. A mile in one minute? No longer just a dream . . . The limits of our continent grew closer together and the public wanted them closer still.

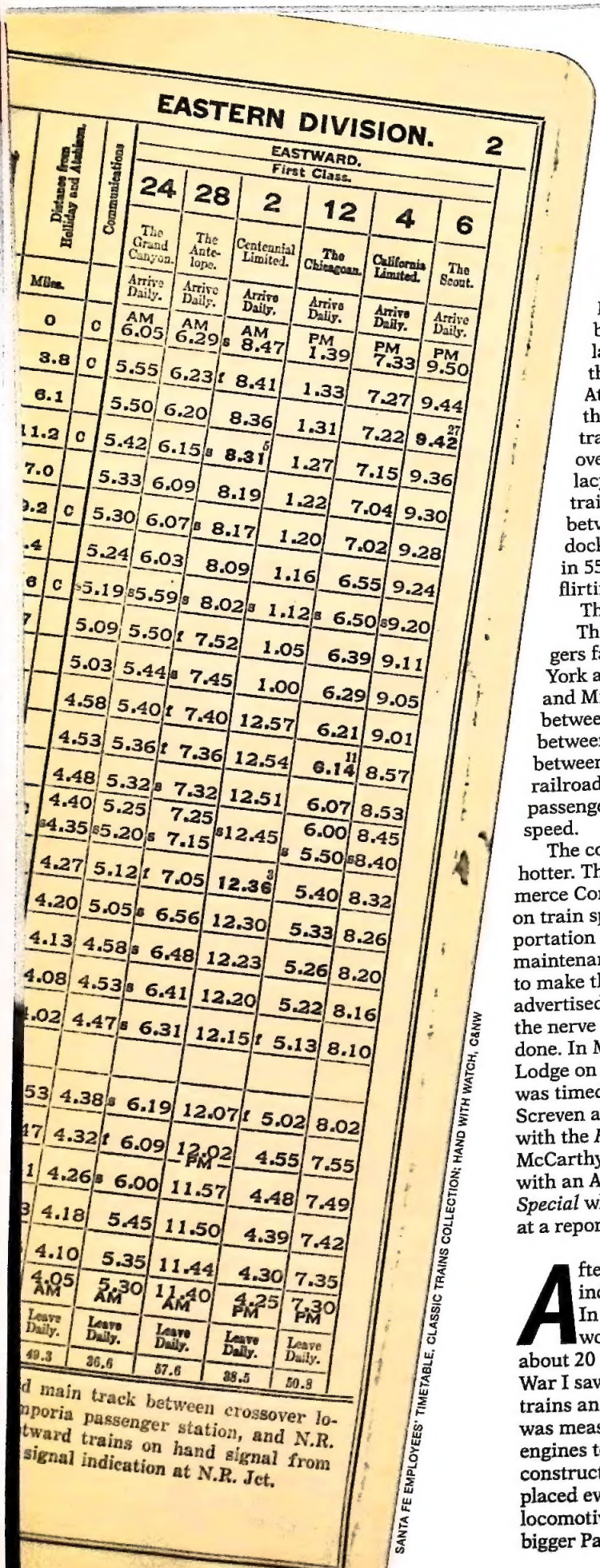
The invention that really made higher speeds possible was the air brake. Instead of relying on a "steam jam" on his locomotive and/or the skills of hardy brakemen distributed throughout the train to slow or stop him, the engineer now had—in his own hand—control of the brakes of the entire train. Not only could trains be heavier and faster, they were much safer, too. The ability to slow and stop safely had to match the achievements of the locomotive designers who by 1890 had produced machines capable of astonishing speed.

Foremost among these engines was New York Central & Hudson River 4-4-0 No. 999,



Union Pacific's *City of Denver*, one of the fast streamliners of the 1930's, races eastbound at Crook, Colo., in August 1951.

DOUGLAS C. WORNOM



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Miles.		Arrive Daily.	Arrive Daily.	Arrive Daily.	Arrive Daily.	Arrive Daily.	Arrive Daily.
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designed by NYC&HR Superintendent of Motive Power William Buchanan, adroitly exploited by p.r.-minded General Passenger Agent George H. Daniels, and driven into the history books by engineer Charlie Hogan who, it was said, got her up to 112½ mph on May 10, 1893. Many doubt that figure today, but regardless of the particulars, 999 was undeniably *moving* that day. Four years later, the Atlantic City Railroad established the first regularly scheduled trains to average 60 mph or more over their entire runs. Drawn by lacy Camelback 4-4-2's, these trains blazed over the 55.5 miles between the Philadelphia ferry dock at Camden and Atlantic City in 55 minutes—a feat that required flirting with the century mark.

The race was on.

The competition to move passengers faster was furious. Between New York and Chicago, between Chicago and Milwaukee and the Twin Cities, between Chicago and St. Louis, between Chicago and the West Coast, between the Northeast and Florida, railroad managers sought to lure the passenger by offering speed and more speed.

The competition stayed hot and got hotter. There was no Interstate Commerce Commission to put arbitrary limits on train speed, no Department of Transportation to establish standards for track maintenance—nothing but the necessity to make things safe enough to match the advertised figures, and engine crews with the nerve and the know-how to get the job done. In March 1901, engineer Albert H. Lodge on Plant System Ten-Wheeler 111 was timed covering the 5 miles between Screven and Satilla, Ga., in 2½ minutes with the *Havana Mail*. PRR engineer Jerry McCarthy may have set a record in 1905 with an Atlantic on the *Pennsylvania Special* when he covered 3 miles in Ohio at a reported 127 mph.

After about 1910, the railroad industry paused to catch its breath. In the passenger arena, speeds would not increase very much for about 20 years. The traffic crush of World War I saw the cancellation of some fast trains and the slowing of others. Progress was measured by the production of larger engines to haul ever-heavier cars. As steel construction and then air-conditioning placed even greater demands on power, locomotive designers responded with bigger Pacifics and Mountains, and finally, Hudsons and Northerns to meet the challenge.

Freight service remained under the restraints of the "drag-era" mentality. Until the early 1920's, designers were concerned with producing locomotives that a yardmaster could use to clean out his whole place. Demands for fast freight service weren't great, and few railroads had power that could reach that speed and hold it with decent tonnage. There were perishable and light merchandise trains carrying silk or strawberries here and there that operated at higher-than-normal speeds, but little effort had been made to market speed and extract a premium tariff for providing it.

A decent speed-up of freight service occurred after Lima Locomotive Works delivered its first "Super-Power" locomotive in 1925. Railroads now had a freight engine with enough boiler capacity to lift significant tonnage up to speed and hold it there. For those roads that wanted it to be over, the "drag era" was indeed over.

But regardless of the trends at the top end of the speed spectrum, for a century and a half or so—when railroads were operated by rule-book, timetable, and train order—there was a constant imperative for trains to get over the road expeditiously. The timetable specified that trains were to be at certain places at certain times, and getting late put a premium on being able to make up that time. There were few trips on which this was not a factor. Call it entropy, call it Murphy's Law, call it human nature—trains simply have a tendency to become late. Adverse weather, equipment failures, heavy traffic, cows on the track, and a thousand other items could delay a train. Caught between the timetable and the clock, railroaders were in a constant battle, and speed was their primary weapon.

Freight trains had to clear the "varnish" runs at named points (sidings or yards) by times specified in the rules, and woe betide the freight crew that "laid the passengers out." A freight engineer not only had to know his own schedule, but those of any passenger trains he expected to meet or be passed by—all this while being concerned with such items as water, fuel, steam, throttle and reverse lever, and

Caught between the timetable and the clock, railroaders were in a constant battle, and speed was their primary weapon.

whatever train-handling obstacles existed on his district. If a passenger train was behind schedule, all trains would receive a copy of a "run late" order given to that train that told its crew how many minutes after the scheduled times they were to pass the stations. Often such orders contained provisions for making up the lost time, if possible.

Being on time made the railroad run smoothly. It brought goodwill to the company by getting passengers and goods to their destinations when promised. For a railroader, it meant you wouldn't be late getting home—and neither would your coworkers. The engineer who could make up time, who could run fast when necessary, was valued by management, respected by his peers, and admired by the public.

In the early 1930's, events began to transpire that would change the railroad passenger business. Good, direct paved highways began to link large cities, and fledgling airlines began to try their wings. These factors, combined with the reduced traffic of the Great Depression, pushed the railroads toward a new age of speed in an effort to win back business.

Across the nation, railroads introduced new passenger trains whose streamlined, lightweight construction was tailored for high-speed running. Older equipment was put on faster schedules. Where more than one railroad served a travel corridor, as with Chicago–Minneapolis/St. Paul, the competition was particularly intense, leading to 100 mph speeds as a matter of routine. In the wide-open West, Union Pacific's *City*-family diesel streamliners scorched the ballast between Chicago and the Coast in 39¾ hours. Not to be outdone, Santa Fe put its new *Super Chief* on a 39½-hour Chicago–Los Angeles schedule. The electrification of PRR's New York–Washington line in 1935 greatly speeded traffic in the nation's busiest corridor.

Overall speeds continued to rise. Donald M. Steffee published his first survey of fast trains in the October 1936 issue of *Railroad Stories* (later called *Railroad*) magazine; he reported that U.S. and Canadian passenger trains ran a total of 40,205 miles at average speeds of 60 mph or more. World War II caused a general slow-down, but speed quickly rebounded after 1945. When the Steffee survey moved to TRAINS magazine in May 1954, the 60-plus figure had risen to 158,905 miles. Two years later, it was 167,835—and then it began to fall, as North America's passenger trains and the infrastructure to support them went into steep decline. By the time of Steffee's last annual speed survey in TRAINS (July 1973), the statistic was absent altogether.

Today, passenger trains in general don't run much faster than they did 30 years ago. The *Metroliners* of the 1960's and *Acelas* of today progressively boosted top speeds in the Northeast Corridor, currently at 150 mph in a few places. But elsewhere, 79 mph is rarely exceeded, and long-haul trains operate on heavily padded schedules. Most improvements in speed have occurred in freight service. Several areas in the West regularly see intermodal trains moving at 70 mph and even faster.

The demise of timetable-and-train-order operation means that being "on time" is not as important as in the past. An increased emphasis on safety discourages or prohibits actions that, while sometimes a bit beyond the letter of the rulebook, were once upon a time necessary to get the job done fast.

The title of this piece? "Make her go fast" was what the head brakeman wryly told this writer some 45 years ago after we were notified by radio that the rear brakeman had caught the caboose and our train was all out on the main track. We had a 20,000-ton train of coal, and just two GP30's for power, so it was beyond anyone's capability to "make her go fast." Still, we both wished we could. ■

Speed Bursts

Speed champ in two centuries

On the New York Central, fast running was routine, as its *20th Century Limited* proved every night by covering New York–Chicago in 16 hours flat. But NYC is also remembered for two feats of speed that were anything but routine. The first came on May 10, 1893, when on-board observers with stopwatches reported that 4-4-0 No. 999 hit 112½ mph with the *Empire State Express* near Batavia, N.Y. Though not universally accepted, this first 100-mph record is part of railroad lore. Thanks to precise instrumentation, there was no doubt at all about the 183.7 mph attained by RDC3 M-497 between Butler, Ind., and Stryker, Ohio, on July 23, 1966. Fitted temporarily with two jet aircraft engines for a research project, NYC M-497 still holds the North American rail-speed crown.

LEFT, TOM MILLER; ABOVE, CLASSIC TRAINS COLLECTION

The great Chicago–Twin Cities

SPEED WAR

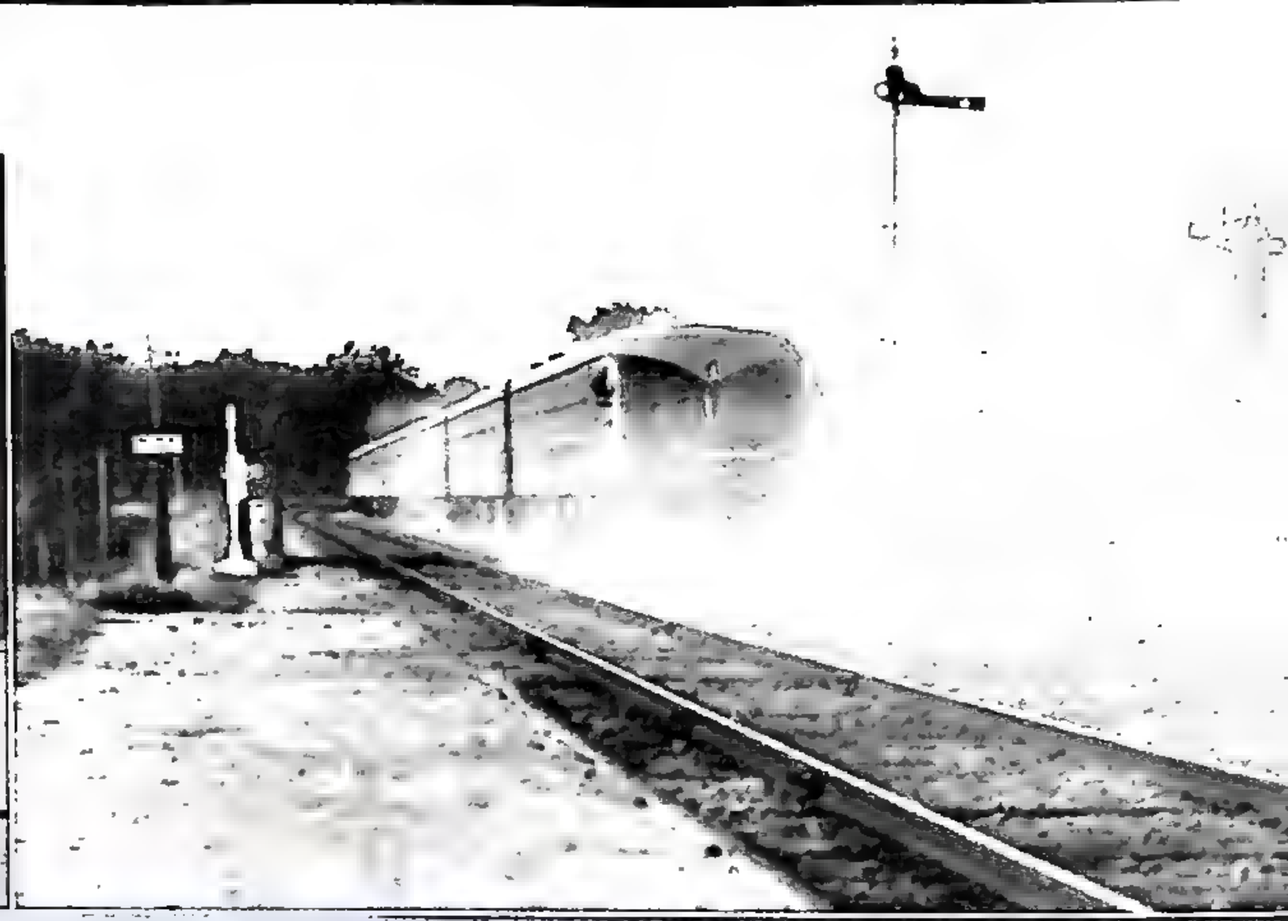
For three decades, North Western's *400*, Burlington's *Twin Zephyrs*, and Milwaukee's *Hiawathas* competed in this 400-mile corridor

BY **JOE WELSH**

Imagine you're a northern Illinois farmer on a humid summer morning in 1950. Your weekly visit to town finds you in tiny Lee (pop. 400), atop a small rise on the Burlington Route main line between Chicago and the Twin Cities of St. Paul and Minneapolis. The occasional barking dog is about all that interrupts the small-town silence. As you take a long swig on your RC Cola, you hear a diesel locomotive horn off to the southeast. It's a bit after 9 a.m., and the train's rapid approach around the curve off toward Shabbona tells you this is the *Morning Zephyr*. Seventy-one miles out of Chicago, the train has made one passenger stop (Aurora) and has seven more in its 356 additional miles before reaching St. Paul Union Depot. If on-time, train 21 will have covered the 427 miles in 6 hours 15 minutes, an average of almost 70 mph. It will end its run 10 miles and a half hour later at the Great Northern Station in Minneapolis, before turning on a wye and speeding back to Chicago.

Lee has five closely spaced grade crossings, but the *Zephyr* doesn't break stride as it barrels into town, the engineer hanging on the horn cord straight through. In just seconds the *Zephyr* is upon you with a *whoosh*; its twin E5's and seven stainless-steel cars—five of them domes—slam through the crossings. As you look toward Rochelle, you glimpse through the flying dust the orange neon TWIN CITIES ZEPHYR sign on the back of the

JOHN PROEBSTING COLLECTION

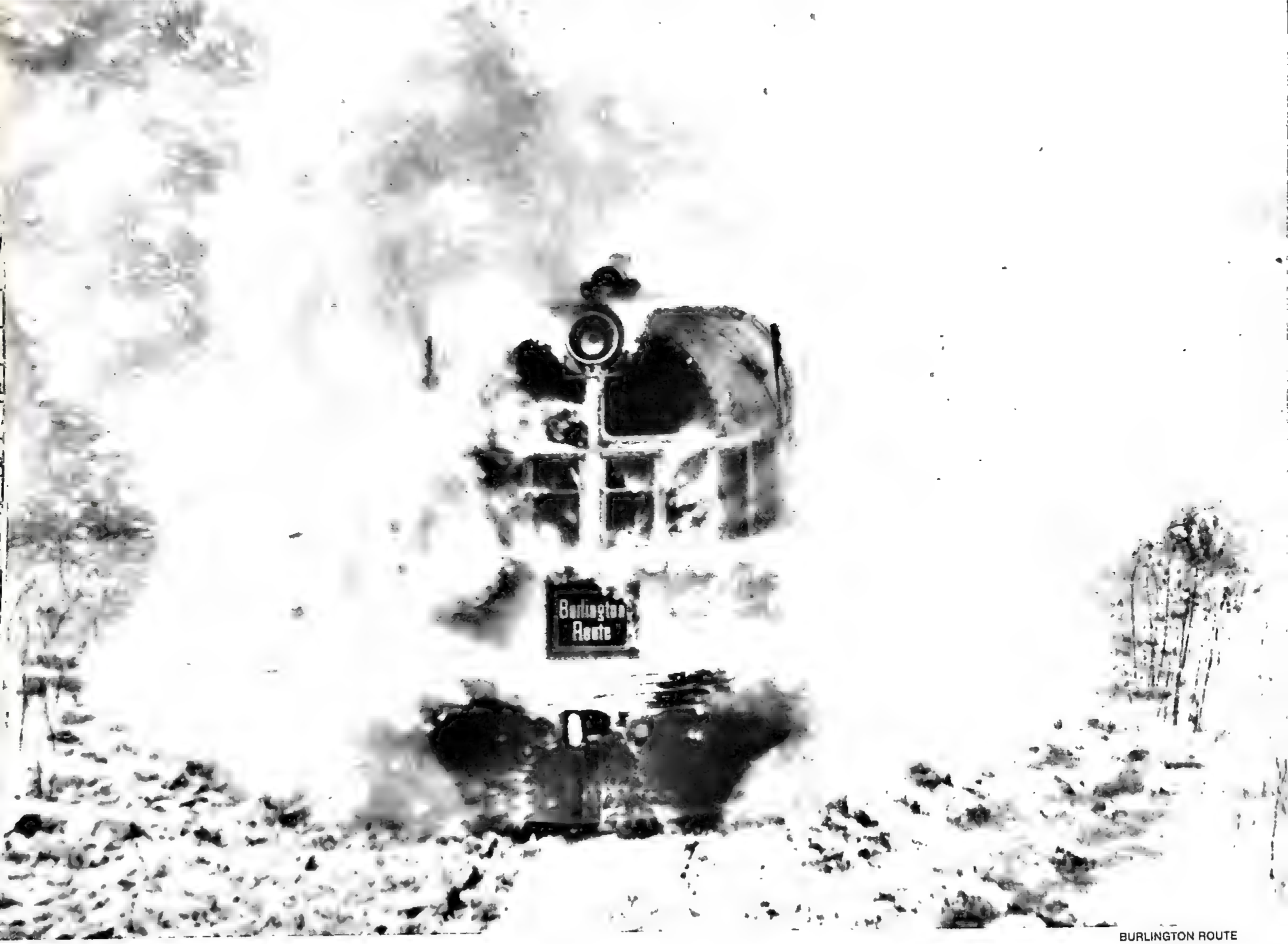


ABOVE, A. W. JOHNSON; BELOW, JIM McCLELLAN

NORTH WESTERN fielded its *400* first, behind steam; the E3's, at Chicago in 1939 (above left), first hauled a heavyweight *400*.

MILWAUKEE'S *Hiawatha* was 4 months old by September 24, 1935, when it raised the dust at 72 mph at Wisconsin Dells (above), trailing the "Beaver Tail" observation car.

BURLINGTON, with "nature smiling 300 miles" along the Mississippi, in 1947 added domes to its *Twin Zephyrs*. This 1965 view is from train 21 north of Savanna, Ill.



BURLINGTON ROUTE

EARL RUHLAND

A. W. JOHNSON; KRAMBLES-PETERSON ARCHIVE

For four years, C&NW's *400* was a heavyweight train in the charge of rebuilt, 2900-series Pacifics; 2907 leaves Milwaukee (above left) in 1938. For this February 1936 publicity shot (top), Burlington piled snow in the "C&I" main at Lee, Ill., for an original *Twin Zephyr* train to hit at 80 mph. Milwaukee's *Hiawatha*, leaving Chicago January 11, 1936 (above right), initially was a five-car train behind new Atlantics.

rear car, a dome parlor observation.

Five domes among seven cars? Domes were Burlington's trump card for its daytime speedsters in this competitive corridor, giving a great view of the riverbank running along the mighty Mississippi north from Savanna, Ill., to St. Paul. "Where nature smiles three hundred miles," is how CB&Q advertised it. In this era, the *Twin Zephyrs*, *Morning* and *Afternoon*, were regular winners in Don Steffee's "Annual Speed Survey" in TRAINS magazine, and it was that long water-level run, as well as the flat farmland across northern Illinois, that allowed Burlington its 90-mph speeds.

Chicago to St. Paul-Minneapolis was one of two short-haul, Windy City-based corridors where in the 1930's at least three railroads began intense daytime competition—Burlington, Milwaukee Road, and Chicago & North Western. (Chicago–St. Louis was the other, where the combatants were the Alton, Illinois Central, Wabash, and for a time, Chicago & Eastern Illinois.)

Speed was synonymous with America's top passenger trains long before the advent of diesels and lightweight, streamlined equipment lit the competitive fires on Chicago–Twin Cities. Fast scheduling was often a by-product of competition, but it first developed on overnight, long-distance trains, the foremost example being Pennsylvania versus New York Central in the premier New York–Chicago market.

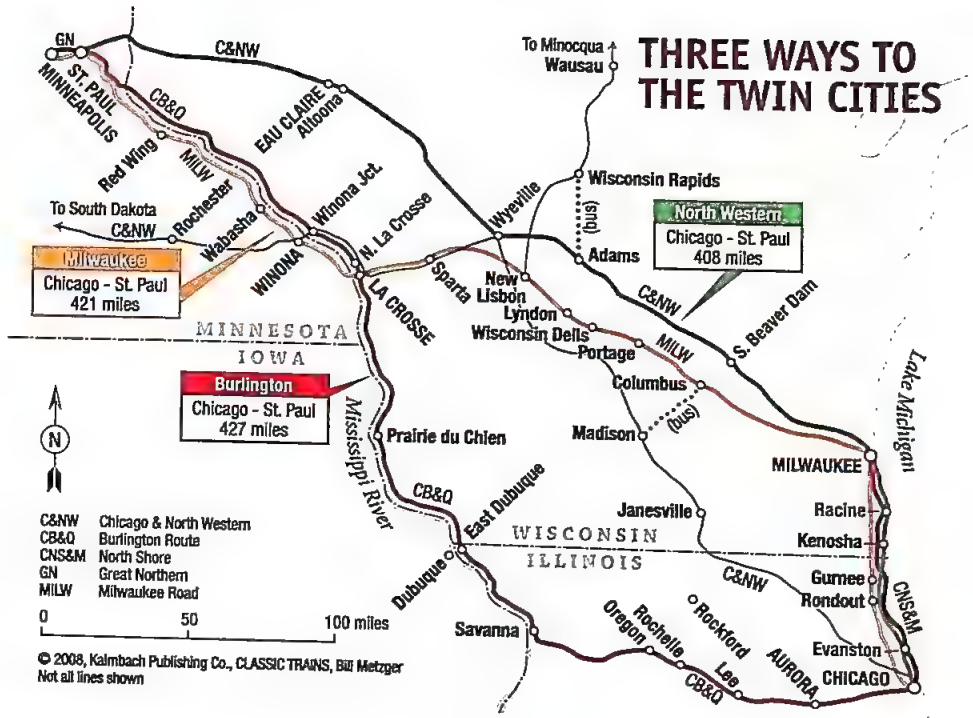
The Chicago–Twin Cities corridor, like elsewhere, historically had been known for its luxurious, but relatively slow, overnight trains. The granddaddy was C&NW's *North Western Limited*, begun in 1888. Milwaukee's *Pioneer Limited* dated from 1898, while the Burlington fielded the *Commercial Limited*, later named *Black Hawk* after the famous Indian chief.

Despite these crack trains, three factors—more rural roads, the proliferation of the private auto (from 8 million to 24 million registered in the U.S., 1920 to 1932), and the impacts of the Depression—by the mid-1930's had made a shambles of what once were lucrative rail markets. Burlington, for example, lost 33 percent of its passenger traffic from 1929 to 1932.

FIRST VOLLEY, AND REACTION

Speed was the only common factor in the Chicago–Twin Cities competitors' initial efforts, which reduced daytime train times from 10½ hours to 7 hours, then 6½, between Chicago and St. Paul.

On January 2, 1935, C&NW drew first blood when it introduced a new train—two trainsets, each comprised of a rebuilt, 79-



MILW, C&NW BROCHURES, HERB DANNEMAN, CB&Q, CLASSIC TRAINS COLLECTION

Public-relations efforts were always in high gear for the fast daytime Chicago–Twin Cities trains. Milwaukee Road touted its being first in the corridor with a full-sized streamliner, Burlington Route its scenery, and Chicago & North Western its speed.

THROUGH THE YEARS, THE FAST WESTBOUNDS OF SUMMER

Train No.	Lv Chicago	Interm. stops*	Ar St. Paul	Ar Mpls.	Miles / Time†	Average speed, Chi.–St. Paul
1940						
CB&Q 21	9:00 am	8	3:00 pm	3:30 pm	427 / 6 hours	71.2 mph
MILW 5	9:45 am	7	5:05 pm	5:45 pm	410 / 7 hours 20 min.	56.0 mph
MILW 101	1:00 pm	6	7:15 pm	7:45 pm	410 / 6 hours 25 min.	65.6 mph
C&NW 401	3:00 pm	7	9:15 pm	9:45 pm	409 / 6 hours 15 min.	65.4 mph
CB&Q 23	3:30 pm	8	9:45 pm	10:15 pm	427 / 6 hour, 15 min.	68.3 mph
1947						
CB&Q 21	9:00 am	8	3:15 pm	3:45 pm	427 / 6 hours 15 min.	68.3 mph
MILW 5	10:30 am	8	6:05 pm	6:45 pm	410 / 7 hours 35 min.	54.0 mph
MILW 101	1:00 pm	6	7:15 pm	7:45 pm	410 / 6 hours 25 min.	65.6 mph
C&NW 401	2:45 pm	6	9:00 pm	9:30 pm	409 / 6 hours 15 min.	65.4 mph
CB&Q 23	4:00 pm	8	10:15 pm	10:45 pm	427 / 6 hours 15 min.	68.3 mph
1954						
CB&Q 21	8:15 am	8	2:30 pm	3:00 pm	427 / 6 hours 15 min.	68.3 mph
MILW 5	10:30 am	8	6:05 pm	6:45 pm	410 / 7 hours 35 min.	54.0 mph
MILW 101	1:00 pm	6	7:15 pm	7:45 pm	410 / 6 hours 25 min.	65.6 mph
C&NW 401	3:00 pm	6	9:20 pm	9:50 pm	409 / 6 hours 20 min.	64.6 mph
CB&Q 23	4:00 pm	8	10:15 pm	10:45 pm	427 / 6 hours 15 min.	68.3 mph
1961						
CB&Q 21	8:00 am	8	2:20 pm	2:50 pm	427 / 6 hours 20 min.	66.7 mph
MILW 5	9:30 am	14	6:10 pm	6:40 pm	410 / 8 hours 40 min.	47.3 mph
C&NW 401	11:20 am	9	6:10 pm	6:40 pm	409 / 6 hours 50 min.	59.9 mph
MILW 3	1:00 pm	8	7:35 pm	8:15 pm	410 / 6 hours 25 min.	62.3 mph
CB&Q 23#	4:15 pm	8	10:35 pm	11:00 pm	427 / 6 hours 20 min.	66.7 mph
1968						
CB&Q 21	8:15 am	10	2:40 pm	3:15 pm	427 / 6 hours 25 min.	66.6 mph
MILW 5	10:30 am	9	6:25 pm	7:10 pm	410 / 7 hours 55 min.	51.8 mph
MILW 3	12:35 pm	9	7:15 pm	7:50 pm	410 / 6 hours 40 min.	61.5 mph
CB&Q 23#	1:15 pm	9	8:20 pm	8:35 pm	427 / 7 hours 5 min.	60.3 mph

* Number of positive and conditional stops between Chicago and St. Paul
† All timings based on Chicago–St. Paul. Source: June or July *Official Guides*
# *Afternoon Zephyr* Summer schedule, operated as a separate train from *Empire Builder*

LOUIS A. MARRE COLLECTION

EMC's 1800 h.p. B-B box-cabs 511-512 of 1935 often tested on the *Twin Zephyrs*, whose own diesels of 1936 (9904 *Pegasus* and 9905 *Zephyrus*) were basically streamlined clones. Lettered just DIESEL LOCOMOTIVE, 511—on train 24 on September 28, 1936—greeted a *Hiawatha* (far right) at St. Paul Union Depot, the only station common to all three competitors.

inch-drivered class E-2 Pacific steam locomotive and five heavyweight cars. Four 4-6-2's had received new running gear and were converted from coal to oil fuel to eliminate engine changes at Adams and Altoona (Eau Claire), Wis. The cars had been rebuilt (10 by C&NW, 2 by Pullman) and given air-conditioning, and the roadbed upgraded to allow the train to run at a scheduled average speed, including four intermediate stops, of 60.5 mph.

The result was an amazing schedule covering C&NW's 408.6 route-miles to St. Paul in a little over 400 minutes—hence the new train's name: *The 400*. Advertised as "The Fastest Train on the American Continent," the service became an overnight sensation, enticing more than 10,000 passengers to ride it in the first month and requiring a sixth, and often a seventh, car.

The Burlington took a different approach. It had embraced the concept of lightweight, diesel-powered streamliners, beginning in April 1934 with the first *Zephyr*, an articulated train of smaller-than-full-size passenger cars. The sleek train, numbered 9900, was made of stainless steel and pulled by a power car with a 600 h.p. Winton diesel engine.

The train had become nationally famous for its radical design and its speed, both showcased in its famous dawn-to-dusk, nonstop run from Denver to Chicago in May 1934; it averaged 77.6 mph on the 1,015-mile run, setting world records for speed and endurance. Shortly thereafter, on July 30, 1934, Burlington tested No. 9900 on the Twin Cities route, which it covered in record time—just a shade over 6 hours and much faster than C&NW's then-current schedule. Five days later, Burlington ordered two sets of *Zephyr* equipment from Budd expressly for the Twin Cities route, and the fight was on.

The *Twin Zephyrs* debuted on April 17, 1935, three months after the *400*, and demand for seats was so great that Burlington began operating them twice daily. To compete, C&NW in the same month shortened the *400*'s schedule to 6½ hours. Despite their speed, the *Twin Zephyrs* were not perfect. Their short fixed consists were inflexible to heavy demand, so on December 18, 1936, "the Q" replaced the original three-car trains with two new seven-car sets and sent the first *Twins* elsewhere, 9901 to Texas and 9902 to Missouri.

The 1937 *Twins* also featured articulated cars, but their "power cars" were separate locomotives, mechanically similar to EMC's five 1936 box-cabs (demonstrators 511 and 512, Santa Fe's "1-Spot Twins" for the *Super Chief*, and B&O 50): 1,800 h.p. B-B units with two 900 h.p. Winton engines in a streamlined *Zephyr* carbody, Nos. 9904 and 9905. Each new *Twin Zephyr* would get an eighth car in 1937.

MILWAUKEE'S SPEEDY STEAM

The third Chicago–Twin Cities competitor was hardly napping, as Milwaukee Road introduced its *Hiawatha* on May 29, 1935. This beautiful gray, orange, and maroon train featured cars newly built in the railroad's own shops in Milwaukee, some of the first full-size, non-articulated streamlined passenger cars in America. The five-car consist was bracketed up front by a restaurant-buffet car, with its windowless "Tip Top Tap Room"—the first cocktail bar on a U.S. train—and on the rear, by the unique "Beaver-Tail" parlor observation car.

The name *Hiawatha*, taken from the legendary swift Chippewa Indian on whom Henry Wadsworth Longfellow based his 1855 poem "The Song of Hiawatha," gave rise to a fleet of Milwaukee Road trains and is still in use today by Amtrak. The first *Hi*, as they came to be called, was pulled by the first modern streamlined steam locomotives in America, 84-inch-drivered, oil-burning A class 4-4-2's Nos. 1 and 2, designed by Otto Kuhler and built by American Locomotive Co. Diesels were still in their formative years, and many railroaders thought steam to be the only motive power capable of pulling full-size passenger cars at the speeds envisioned.

Like the *400*, the *Hiawatha* proved that neither steam nor full-size cars were a hindrance to running at a blistering pace. On a May 15, 1935, test run two weeks before its revenue debut, Atlantic No. 1, pulling five cars, hit 112.5 mph. Neither the engine nor the cars appeared any worse for wear; the engineer that day reported that the faster the "A" went, the better she appeared to perform. Speed was natural for the *Hiawatha*—it was designed for it. And scheduled for it—Chicago–St. Paul in 6½ hours with six stops, an average speed of over 63 mph. A connecting train at New Lisbon, Wis., ran up the Wisconsin River valley to Wausau and vacation points.

Their mid-day departures, speed, beauty, and markets quickly made the *Hiawathas*, trains 101 and 100, incredibly popular. A fourth coach, then a fifth, soon were added. The 100,000th passenger boarded in November 1935, and by the end of March '36, that number had doubled. In their first 12 months, the trains netted $700,000. Responding, Milwaukee on October 11, 1936, introduced a second, all-new nine-car train, still with A-class Atlantics up front (Nos. 3 and 4 arrived in 1936 and '37), and for the first time, with the railroad's hallmark ribbed-side cars.

As demand continued to rise, Milwau-

Again, the "fastest train in the world"

JAMES A. NEUBAUER

A new crew and passengers wait as E5's ease the 8-car (5 domes) *Morning Zephyr* 21 to a stop at Savanna, Ill., on May 4, 1952. It's high-water time on the river, at right.

When fast times still mattered, each year TRAINS magazine would publish Don Steffee's "Speed Survey," which mostly was concerned with timing on segments within a journey, not overall end-point-to-end-point schedule times. It was here where Burlington's *Twin Zephyrs* gained their fame.

Not only did the *Morning Zephyr* win the U.S. title in 1940 with the La Crosse route change [page 22], but both CB&Q 21 and 23, the westbound *Twins*, were anointed as the fastest scheduled trains in the world in 1953, thanks to a 38-minute timing over the 54.6 miles from East Dubuque, Ill., to Prairie du Chien, Wis.—86.2 mph. Their eastbound counterparts, Nos. 22 and 24, made the 57.7-mile La Crosse–Prairie du Chien leg in 41 minutes—84.4 mph. At the time, the fastest segments for speed king contenders Illinois Central and Santa Fe were 81.8 mph and 80.2 mph, respectively.

The Q reduced its top speed along the Mississippi River to 79 mph in 1957. Thereafter, the only 80-mph-plus territory on the railroad was the "C&I" (Aurora–Savanna, Ill.), and Milwaukee Road train 16, the eastbound *Olympian Hiawatha*, became the fastest train in the world for a year with an 82.5 mph average from Tomah to Portage, Wis. Interestingly, CB&Q 24 in 1957 was scheduled to run east on the triple-track "raceway" from Aurora to La Grange in 19 minutes, an average speed of 75.8 mph. This required some serious 8th-notch hauling.—*Michael W. Blaszak*

E. T. HARLEY

Milwaukee Road train 100, behind a Kuhler-styled F7 Hudson (above), nears the C&NW diamonds at Mayfair in Chicago in 1941. Behind CB&Q 9904 or 9905, a *Twin Zephyr* (left) heads around the wye east of St. Paul Union Depot on its morning run to Chicago.

RAIL PHOTO SERVICE: H. W. PONTIN

kee ordered from Alco six new streamlined, coal-burning Hudson 4-6-4's and began building 35 more cars in its own shops. This third version of the *Hi*, with 9 cars per train, entered service on September 19, 1938, renamed *Afternoon Hiawatha*. The Beaver-Tail cars added a wing, or fin, to their flat backs, and bigger windows, but a bigger change was up front. In addition to being arguably among the most beautiful streamlined steam locomotives ever built, the six F7 class 4-6-4's, Nos. 100-105, styled by Otto Kuhler, were speed demons, making child's play of the lightweight streamliners they hauled. Topping 80 mph for much of their daily runs, the F7's were easily capable of their regularly scheduled 100-mph segments, around places like Gurnee, 38 miles out of Chicago, or Lyndon, 9 miles west of Wisconsin Dells.

Carrying over 800 passengers a day for three years, the *Hiawathas* by 1938 had become some of the most famous and successful trains in the world. They consistently ranked second in earnings among all U.S. passenger trains, behind only Southern Pacific's beautiful *Coast Daylight* between Los Angeles and San Francisco, also steam-powered.

THRUST AND PARRY CONTINUES

With the nation's prosperity rebounding as the 1930's progressed, the intense three-way Chicago–Twin Cities competition continued. Milwaukee Road, further responding to more ridership growth and now with enough new cars built, on January 21, 1939, followed the CB&Q in doubling its service, making trains 5 and 6 the *Morning Hiawatha*.

The North Western, which never did add a second Twin Cities daytime speedster, answered on September 24 with a streamlined *400*. All three roads in the cor-

For Chicago-Milwaukee, a "juiced" competitor

While the Twin Cities-Chicago railroads were stealing the headlines in the early 1940's, an electric interurban was nabbing its own share of the Chicago-Milwaukee passenger market. The Chicago North Shore & Milwaukee began operation in 1895 and flourished in the 1920's, but unlike many other interurbans, survived the Depression with much of its service intact. By 1941, business was good enough that the "North Shore Line" introduced its own streamliners.

Dubbed *Electroliners*, they were billed as "America's first all-electric luxury trains." The two sleek, four-car, green-and-salmon streamliners from St. Louis Car Co. were articulated, included a dining section, and were built to handle the tight curves and clearances of a route that included street-running in Milwaukee and the high-level platforms of Chicago's elevated rapid-transit system, including on the downtown Loop. (The only other notable interurban streamliners of the era, Illinois Terminal's three trains of 1948, also were an adjunct to a neighboring speed-conscious corridor, Chicago-St. Louis. But IT's trains, which linked St. Louis and Springfield, Ill., with East Peoria and Decatur, were a flop, lasting less than 9 years.)

The *Electroliners* made five round trips daily to augment North Shore's 14 other hourly weekday departures in each direction. Once free of the Chicago urban environment, the *"Liners"* could really stretch their legs, racing at 80 mph or faster on CNS&M's main line before entering the city streets of Milwaukee. With their swept-back noses, the *Electroliners'* lines resembled those of the early *Zephyrs*, but they competed directly with C&NW's *400's* and Milwaukee's *Hiawathas*, plus lesser local trains, in the corridor.

The North Shore Line quit on January 21, 1963, but the *Electroliners* were around to the end, and both trainsets survive today in museums, one in Illinois, one in Pennsylvania.—*Joe Welsh*

GEORGE KRAMBLES PHOTO; KRAMBLES-PETERSON ARCHIVE

Splitting the afternoon air in 1949, one of North Shore Line's two *Electroliners* sails southward on the Skokie Valley route.

ridor now had a "first," C&NW's being a lightweight, diesel-powered streamliner of full-size, non-articulated cars. Two pairs of new Electro-Motive Corp. E3A diesels, Nos. 5001A&B and 5002A&B—which arrived in May and June 1939 and so pulled the heavyweight *400* through the summer—powered the gorgeous new train of 10 yellow-and-green Pullman-Standard cars, a round-end club parlor-observation on the rear. (Yellow and brown were planned, to match the C&NW-UP Overland Route Streamliners, but C&NW's historic yellow and green won out.) The new equipment allowed C&NW to speed up the trains, matching the Milwaukee's 6½-hour schedule, which then was reduced to 6¼ hours just before World War II. Predictably, the new C&NW *400* garnered attention and substantial ridership, a 46 percent increase in its first year.

In response, Burlington in 1940 reduced the schedule of its *Twin Zephyrs*, still running with their 1937 equipment, to 6 hours flat Chicago–St. Paul for train 21. (St. Paul Union Depot, the only terminal where the three competing Chicago–Twin Cities carriers met, was the standard measuring point for schedules to and from the Windy

LINN H. WESTCOTT

The *Hiawathas'* second-edition Beaver-Tail obs cars added a vertical fin. Here 101 and local 58 (at left) meet at New Lisbon, Wis., in 1941. Waiting at right is streamlined 4-6-0 No. 10 with train 201, the *Hiawatha-North Woods* connection for Wausau and Star Lake, Wis.

A. ROBERT JOHNSTON; C&NW HISTORICAL SOCIETY COLLECTION

North Western's *400* changed the least of the three competitors over the years. By the early '50's, newer E8 diesels were the rule, as here leaving Eau Claire. West of Wyeville, the route on was on subsidiary Omaha Road, which ran right-handed on double track.

ity. Across the Twin Cities, MILW used its own trackage to its Minneapolis station [shared with Soo Line and Rock Island], while CB&Q and C&NW ran on GN track to GN's Minneapolis station. In Chicago, C&NW used its own passenger terminal, while the other two used Union Station.)

A route change helped CB&Q achieve the 6-hour running time, which made the westbound *Morning Zephyr*—with an overall average speed above 70 mph—the fastest train in the country. On January 27, 1940, Burlington opened a new passenger station in La Crosse, Wis., east of downtown on a freight bypass line. This shaved 15 minutes off the old schedule, but trains still had to stop 2 miles to the north at North La Crosse, CB&Q's terminal, for a crew change.

Impressed with the reported efficiency of the diesels of its competitors, the Milwaukee invested in its first passenger diesels in 1941: two each Alco DL109's and EMD E6A's, Nos. 14&14A and 15&15A, respectively. The E6's, especially, proved to be incredibly reliable, handling a Chicago–Minneapolis round trip, with a layover as short as 90 minutes, every day for seven years. They came to be called "Famous 15."

J. DAVID INGLES COLLECTION

Milwaukee's "Famous 15" pair of E6A's (below) still had gray in their livery as they wheeled the *Morning Hi*, train 6, under the North Shore Line at Rondout, Ill., on August 21, 1949. Black replaced gray on the FP7-F7B-FP7 trios that helped succeed them, as on a westbound *Hiawatha* (left), nearing the Milwaukee station in the mid-'50's.

H. M. STANGE PHOTO; KRAMBLES-PETERSON ARCHIVE

Things slowed down a bit during World War II. Most Chicago–Twin Cities schedules were lengthened by 15 minutes or so, owing to increased freight traffic, higher passenger ridership (with correspondingly longer station dwell times), and restrictions on acquiring new passenger equipment (which meant that cars worn out by high-speed operation could not be replaced).

Realizing the end of the war would bring more competition, CB&Q, C&NW, and MILW acted quickly to invest in new streamlined passenger cars and diesels. The most dramatic upgrades came to the *Twin Zephyrs* and *Hiawathas*. CB&Q in 1945 introduced the first modern American dome car, *Silver Dome*, rebuilt from a coach, debuting it on the *Twin Zephyrs* to give patrons a rooftop view of the river. Although Milwaukee's Twin Cities route followed the Mississippi's west bank for 125 miles north of La Crosse, Wis., neither MILW nor C&NW could match the Q's 282 miles of "nature smiling."

The dome was a natural for the Q's route, and in December 1947 the road re-equipped both *Twin Zephyrs* with seven-car consists of full-size, non-articulated, stainless-steel cars, a whopping five of

J. DAVID INGLES

On Saturday, March 31, 1962, *Morning Zephyr* 21 has "only" three domes among its six cars as it nears La Grange, Ill.; the lead E7 wears silver paint, the other is stainless steel. At right, an NYC Geep heads down the Indiana Harbor Belt interchange track.

J. DAVID INGLES

Afternoon Hiawathas 2 and 3 (with Skytop obs *Coon Rapids* on the rear), meet at "the Dells" at 4:20 p.m. on July 12, 1969. Behind FP7 101A on No. 2 is a 7-month-old FP45.

which on each train had domes!

Likewise, the Milwaukee again re-equipped its *Morning* and *Afternoon Hiawathas*. Its first E7 diesels arrived in June 1946, upon which the F7 4-6-4's followed their A-class forebears onto lesser trains. By 1948 Milwaukee had added 153 new passenger cars to its fleet, enough to completely re-equip the Twin Cities daytime trains. The signature cars of these newcomers were the unique, Milwaukee-built "Skytop" parlor observation cars. The *400* largely made do with its prewar equipment, although it was upgraded with 20 new coaches beginning in 1946.

SIMILARITIES, DIFFERENCES

The end-to-end running times of the trio's top trains didn't vary much in the immediate postwar years, though CB&Q was sometimes 10 to 15 minutes faster [see chart, page 18]. By 1950 the fastest schedules were identical on all three roads. Timetables for 1955 show C&NW's running time just 5 minutes longer than MILW and CB&Q, although later on, C&NW's schedule would get slower.

The diesels also advanced. On CB&Q, the E5's were joined by E7's, 8's, and 9's, all eventually in one big pool. C&NW graduated to E7's and 8's. The Milwaukee replaced E's with FP7-F7B-FP7 trios in 1950, adorned in a new orange-and-maroon styling that became standard until the road switched its passenger livery to UP Amour yellow after it replaced C&NW on the Chicago–Omaha Overland Route leg in 1955. MILW also began mixing its F's with newer E9's, and later, new FP45's.

Beyond motive power, there were few similarities. Take individual markets. The Milwaukee benefited from serving three strong intermediate Wisconsin points: its big-city namesake, tourist center Wisconsin Dells, and regional commercial center La Crosse, plus the college town of Winona, Minn. MILW also offered the connecting "Valley Service" at New Lisbon.

Burlington Route, despite not directly serving Rockford, then Illinois' third-largest city, aggressively marketed its services there, promoting its stop at Oregon, Ill., just 25 miles southwest. Oregon loadings were significant enough that the Q maintained a Rockford ticket agent until the advent of Amtrak. CB&Q served four other large towns: Aurora, 38 miles out of Chicago; Dubuque, Iowa (by a bus from East Dubuque, Ill.); La Crosse; and Winona (a bus from Winona Junction, Wis.).

The North Western, by contrast, west of Milwaukee served only one large regional center, Eau Claire, Wis., although in postwar years the *Twin Cities 400* offered a connection at Wyeville with the *Dakota 400*, a Chicago–Madison–Winona–Rochester (Minn.) train that went on to South Dakota points. (From Wyeville to St. Paul, the *Twin Cities 400* used the rails of C&NW subsidiary Omaha Road.) There was also a bus connection from Adams, Wis., a remote, small-town C&NW crew-change stop, north to Wisconsin Rapids.

Equipment also differed. On New Year's Day 1953, Milwaukee's *Morning* and *Afternoon Hiawathas* added full-length P-S Super Dome lounge cars ahead of the diner. The domes, which seated 68 under glass, were the first of their kind in the U.S. and, with the Skytops, distinguished the *Hiawathas* as modern, attractive trains.

Burlington's trains had their five domes (one a parlor car), each seating 24 up top, while again by contrast, C&NW's *400* had few new cars to offer, and no domes. The North Western had been under increasing financial strain after the war, and its 1955 pullout from operating UP's Streamliners underscored its growing disenchantment with intercity passenger trains.

A third difference was departure times. The westbound *Morning Hi*, with its later departure than the *Morning Zephyr*, was well-timed to attract transfers from East Coast overnight trains; Baltimore & Ohio, in fact, despite a necessary change of stations in Chicago, liked to route its interline passengers via Milwaukee Road for this reason. In the afternoon, though, the *Afternoon Zephyr*, with its 4 p.m.

departure, was better timed to allow a nearly full business day in the Windy City than the *Afternoon Hi*'s 1 p.m. departure or the *400*'s at 3 p.m.

ULTIMATE RIVALS NOT ON RAILS

Competition from the auto and the airplane, of course, would prove deadlier than the two decades of head-to-head rail rivalry that had given rise to the hot schedules and wonderful trains. The schedule chart of summer westbounds on page 18 shows how speed became less important as the years passed, and more intermediate stops began to be served, especially on the Milwaukee. By the late 1950's, the Chicago–Twin Cities market was unable to support three separate services. C&NW was first to bow out, when the *Twin Cities 400* made its last run on July 23, 1963.

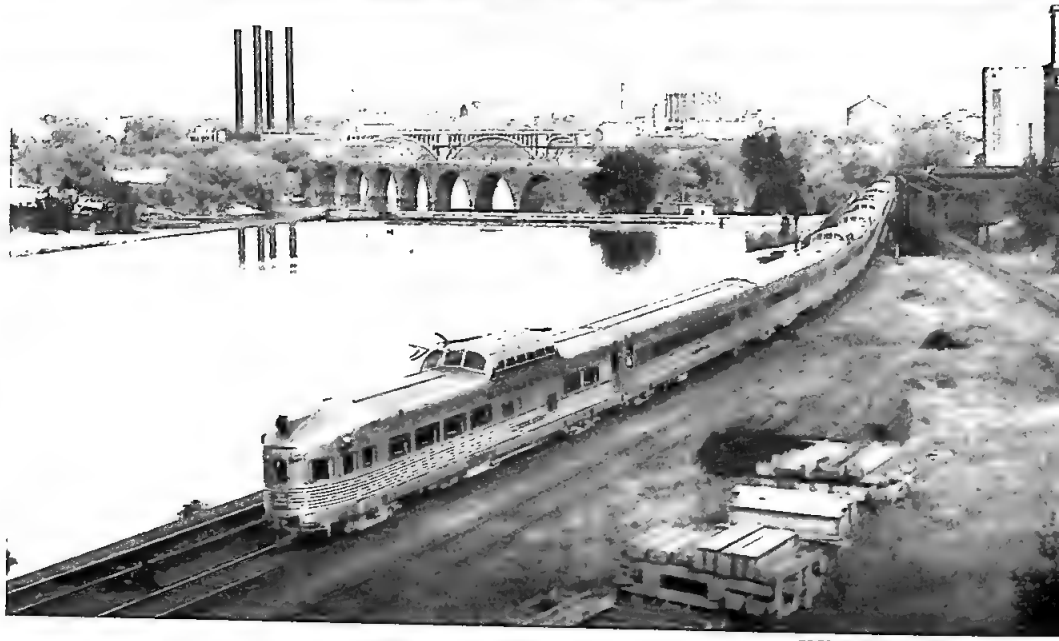
Milwaukee was also feeling the pinch, experiencing a $24 million passenger deficit in 1957. In February of that year it consolidated the Seattle/Tacoma–Chicago *Olympian Hiawatha*—a streamliner only a decade old—between Minneapolis and Chicago eastbound with the *Morning Hi* and westbound with the *Afternoon Hi*. The consolidation was short-lived. Beautiful as the *Olympian Hi* was, with its Super Dome and its Skytop sleeper obs, it could no longer compete with the speedier Great Northern *Empire Builder* and Northern Pacific *North Coast Limited* . . . not to mention Northwest Orient Airlines. The last *Olympian Hiawathas* left each end point on May 22, 1961.

More *Hiawatha* retrenchments followed. The Skytops came off in April 1969, though conventional parlor cars remained. Then on January 23, 1970, the *Afternoon Hiawathas* made their final runs, leaving only the morning trains until Amtrak began on May 1, 1971, whereupon they were replaced by an *Empire Builder* rerouted via Milwaukee on the Milwaukee Road.

Meantime, things hadn't been much better on the Burlington. By the late 1950's, off-season (summer and holidays) consolidations for the *Twin Zephyrs* had become a reality. The *Afternoon Zephyr* was combined westbound with the *Empire Builder* to St. Paul and eastbound with the *Western Star* from St. Paul. (Moreover, the *Builder* and the *North Coast Limited* also were combined.)

When Louis Menk became CB&Q president in October 1965, he took a hard look at the passenger operations, which meant all *Zephyrs* were in for a rough ride. Both the *Morning* and *Afternoon Twin Zephyrs* were discovered to be money-losers. Once the flagships of the Q's intermediate-length marketing efforts, they now were liabilities. Eventually renumbered from the traditional 21-24 to 7-10 in preparation for the Burlington Northern merger, their onetime five-dome consists, although still carrying diners, were whittled as demand warranted (parlor service came off in 1967 and '68), and all but the westbound *Morning Zephyr* were combined with Pacific Northwest trains. The new numbers carried through the March 1, 1970, merger, and for 13 months the *Twin Zephyrs* were BN trains.

Amtrak's system left the scenic former CB&Q route between Aurora and St. Paul bereft of passenger service. No longer would tiny Lee witness the flash of daily streamliners. The curtain rang down sometime in the wee hours before dawn on May 1, 1971, when the last eastbound *Afternoon Zephyr* (again a stand-alone train as the connecting former NP *Mainstreeter* ended at St. Paul) rolled into Chicago Union Station with no fanfare. The train, which had once made the St. Paul–Chicago run in a little over 6 hours and was still carded at a respectable 6¾ hours, was a whopping 5 hours late! No. 10's tardy arrival was far from a fitting end for a train, or its competitive corridor, that had once been as fast as the wind . . . and much more reliable.



FRED H. MATTHEWS JR.

Its orange neon tail sign aglow, CB&Q 24, the *Afternoon Twin Zephyr*, is just out of the Great Northern station in Minneapolis in July 1957 as it approaches James J. Hill's Stone Arch Bridge over the Mississippi. Ahead of the two parlor cars and diner: five domes!

ED DEROUIN

Lounge cars 7200 and 7201, the only round-end observations on C&NW's roster, lasted until the end. In 1964 they were sold to National of Mexico for continued service. In April 1962, westbound 401 rolls past Main Street toward its Davis Street stop in Evanston, Ill.

Speed Bursts

Pennsy's high-flying Atlantics

Few railroads were as devoted to the 4-4-2 Atlantic type as the Pennsylvania, on whose rails 4-4-2's achieved two blistering speed runs. On June 12, 1905, PRR class E2 No. 7002, making up time with the New York–Chicago *Pennsylvania Special*, hit 127.1 mph near Ada, Ohio—or so it was reported at the time. A more believable feat occurred one day shy of 22 years later, when E6s No. 460 whisked a two-car International News Reel Co. special 216 miles from Washington, D.C., to Manhattan Transfer,

N.J., in 2 hours 55 minutes, topping 100 mph several times along the way. By developing films en route in a baggage car, International beat competitors to New York theaters with scenes of Charles Lindbergh's triumphant arrival in Washington after his trans-Atlantic solo flight. The powerful E6's regularly whisked long, all-steel trains between New York and Washington, as depicted here in artist Gil Reid's stirring watercolor *On the Road*, produced for the dust jacket of the 1963 Kalmbach book *Apex of the Atlantics*.

Introducing the world's fastest freight train . . .

SANTA FE'S

Let's ride with the engineer for 268 miles on the inaugural run

BY **JACK ELWOOD**

From August 1966 to July 1971, during my long career with the Santa Fe, I was Road Foreman of Engines at Gallup, N.Mex. My territory included the 1st and 2nd Districts of the Albuquerque Division, part of ATSF's Coast Lines, between Belen, N.Mex., and Winslow, Ariz. When our president, John S. Reed, signed off on a new, premium, fast freight-train service between Chicago and Los Angeles—called *Super C* as a play on the "Chief" passenger-train fleet's name—supervisors all along the route received instructions and began to plan for the operations over their territories.

We held local staff meetings. Train dispatchers were given explicit instruction on the handling of both the test runs [page 32] and the *Super C* itself. People in all departments that would be involved were advised of their responsibilities: section foremen and their track gangs, signal department folks and maintainers, and mechanical department employees. To ensure these trains would incur no delays, the implied "command" from the operating vice president was that they—even the test runs—were "Mr. Reed's Babies."

My 268-mile territory was double-track main line equipped with automatic block signals and automatic train stop (ATS). Westward, its profile began at 4,774 feet above sea level at Belen, climbed to 7,238 feet at the easy-to-miss Continental Divide at Gonzales, N.Mex., then descended through Gallup, N.Mex. (6,488), to Winslow (4,852). Despite hosting heavy traffic, then as well as now as part of BNSF's "Transcon," this was not a main line on which an engineer could open the throttle to "Run 8" (full) and just cruise at maximum speed all the time. The 141-mile 1st District had a number of curves with speed restrictions from the authorized maximums on tangent track, and things weren't much different on the 127-mile 2nd District.

ALL ABOARD IN BELEN

Climb with me up into the cab of the lead FP45, No. 100, on *Super C*'s inaugural

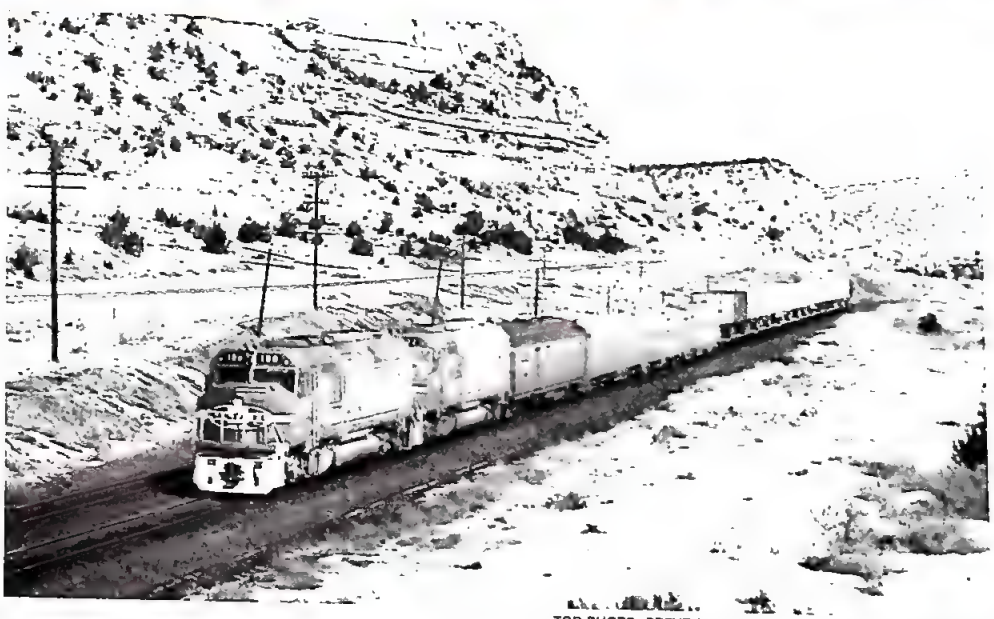
The inaugural *Super C*, with 14 trailers ahead of the caboose, rounds the curve off the Des Plaines River bridge in Lemont, Ill., at milepost 25 from downtown Chicago.

"SUPER C"

run west out of Belen on January 18, 1968. Our trailing unit is No. 102; the locomotives, bought for the premier passenger trains, are only a month out of EMD's factory. Our cab floor is 10½ feet above the top of the rail, giving us a bird's-eye view of the railroad. The cab might become a bit crowded on this occasion, but I hope you'll get the feel of how we helped the launch of the world's fastest freight train.

I'll be running *Super C* at 90 mph at every point possible. On all other districts, top speed is 79, but the Coast Lines general manager, an aggressive and adventurous railroader, raised our maximum to 90. The overspeed device on these FP45's, as well as their General Electric U28CG counterparts, cuts in at 92 mph. Needless to say, the sensation of operating a freight train at 90 mph will be a new one for me.

It's a cold, clear morning, and the crew has been called on duty 45 minutes ahead of the train dispatcher's "final," his esti-



TOP PHOTO, STEVE PATTERSON; ABOVE, SANTA FE RAILWAY

With author Jack Elwood at the throttle of FP45 100, the first *Super* C rolls west of Gallup.

TWO PHOTOS, STEVE PATTERSON

The first *Super C* waits at Corwith Yard on January 17, 1968, for officials and guests to board. At right is the special—a Fairbanks-Morse H12-44TS diesel and three hi-level cars—that bought them out from Dearborn Station. Later on the Illinois prairie (left), *Super C* meets No. 12, the *Chicagoan*.

mate on when *Super C* will arrive. All other trains are called on their final, but this crew has the extra 45 minutes to ensure this train will not be delayed.

We're gathered at the west end of the Belen passenger station, anxiously watching to the east for a headlight, which here can be seen for a great distance as the railroad drops downhill from Mountainair. Soon the *Super C* is slowing to a stop right where we are standing. The crews change without delay. Our adrenaline is flowing; we are anxious to leave town. The inbound engineer says everything is running well. As I take the engineer's seat, I check the air gauges and equipment. The car inspector has placed the blue safety flag in the frame of the cab window and is checking the train's brake shoes and brake rigging, and making the federal 500-mile inspection, which is mandatory on all freight trains. The locomotives' fuel tanks are being topped off, and when the inspection is complete, the car inspector removes the blue flag; we are free to go when cleared. We have the two units of 3,600 h.p. each, a test car, three business cars, seven piggyback flatcars carrying 14 trailers, and a caboose.

Over the radio, we get our "highball"; the dispatcher has given us a green signal. It's 9:34 a.m. as we start moving out of Track 2 in the passenger yard. Just over a quarter-mile from our starting point, we have to go through a 30-mph crossover to get to the south track, which becomes the westbound main at Dalies, 10.8 miles out, where the passenger main from Albuquerque comes in. I have the throttle open sufficiently to get our train speed quickly up to 30. Approaching the crossover, I make a 10-lb. air-brake application to hold the speed through the crossover. With this first application, I get a feel of how the train brakes, knowledge I will use to govern brake applications as we head west.

When the train is halfway through the crossovers, I release the brakes and move the throttle to Run 8 for the grade to Dalies, a climb of 500 feet in 10 miles. At Dalies

we have a 40-mph restriction through the crossover. Since we are on the upgrade doing 70, I will ease off on the throttle and let the grade reduce our speed to 40. Note that one must know how far in advance of the restriction to ease down the throttle—do it too soon, and we'll slow too early, delaying the train unnecessarily. I have the throttle open full as the train's rear end clears the restriction. I do this here because, after passing Dalies, the railroad is downgrade for 24 miles to Rio Puerco, a drop of 216 feet. It is 70-mph track.

The dynamic brake can be used effectively in this instance. The trick is to release the dynamic brake step by step in a way that it will all be released, to be in power position as the caboose comes around the 60-mph curve at Rio Puerco, with the throttle in Run 8. Keep in mind we have run 24 miles downgrade, which will have required periodically applying and releasing the train's air brakes to maintain the required speed of 70.

MAXIMIZING PERFORMANCE

At Rio Puerco, the two main tracks diverge. The westbound curves to the left (south) to follow a low range of hills, providing for a more moderate grade than the eastbound. We pass the siding of South Garcia at Milepost 43x. The mains come together at Suwanee, 9 miles west, and continue so to the next siding at Marmon, 10.4 miles away. Leaving Marmon we enter a canyon; the next siding is Quirk.

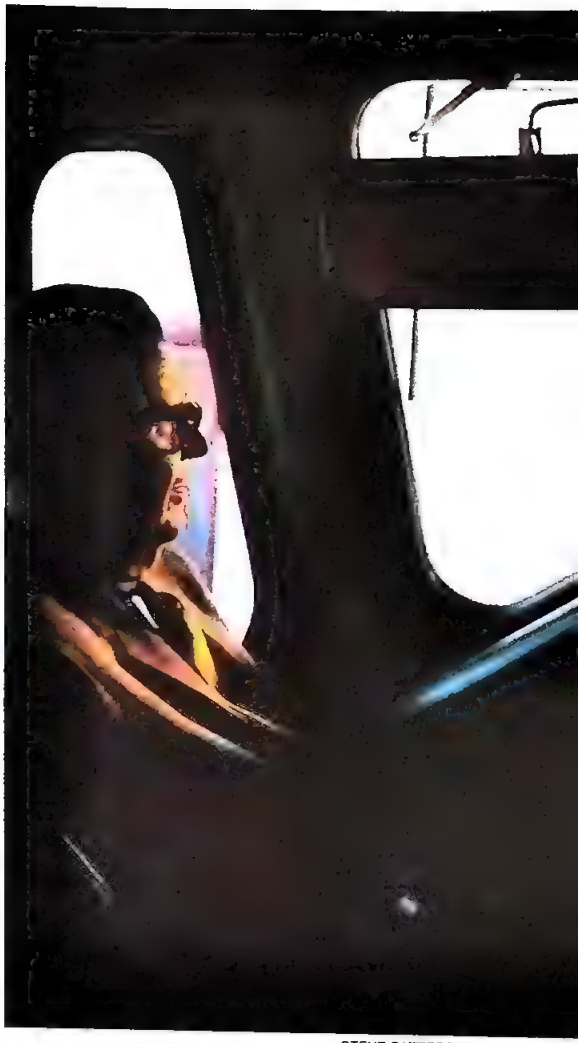
Between Marmon and Laguna are five reduced-speed curves, and the first permanent speed board (sign) is just west of Marmon's west switch. This is a 70-mph restriction, so when we pass the board, I know the restriction begins in one mile. We've been running at 90, remember.

I will use the knowledge gained from that 10-lb. brake application leaving Belen to determine how much air to set. As I make the application for the 70-mph restriction, we have four more slow curves in close proximity, so it will be necessary to hold my initial set for the next restriction of 60, then release the brakes as we approach the third restriction, which is 50.

As the train brakes are releasing, our speed has dropped to 50, but at the same time, I am opening the throttle and have the train speed once again increasing as our caboose clears this restriction, without any significant loss of time as we approach the next two restrictions. With the *Super C*, and other trains, there are some variations depending on conditions, as the speed restriction would call for. The engineer's experience is the determining factor.

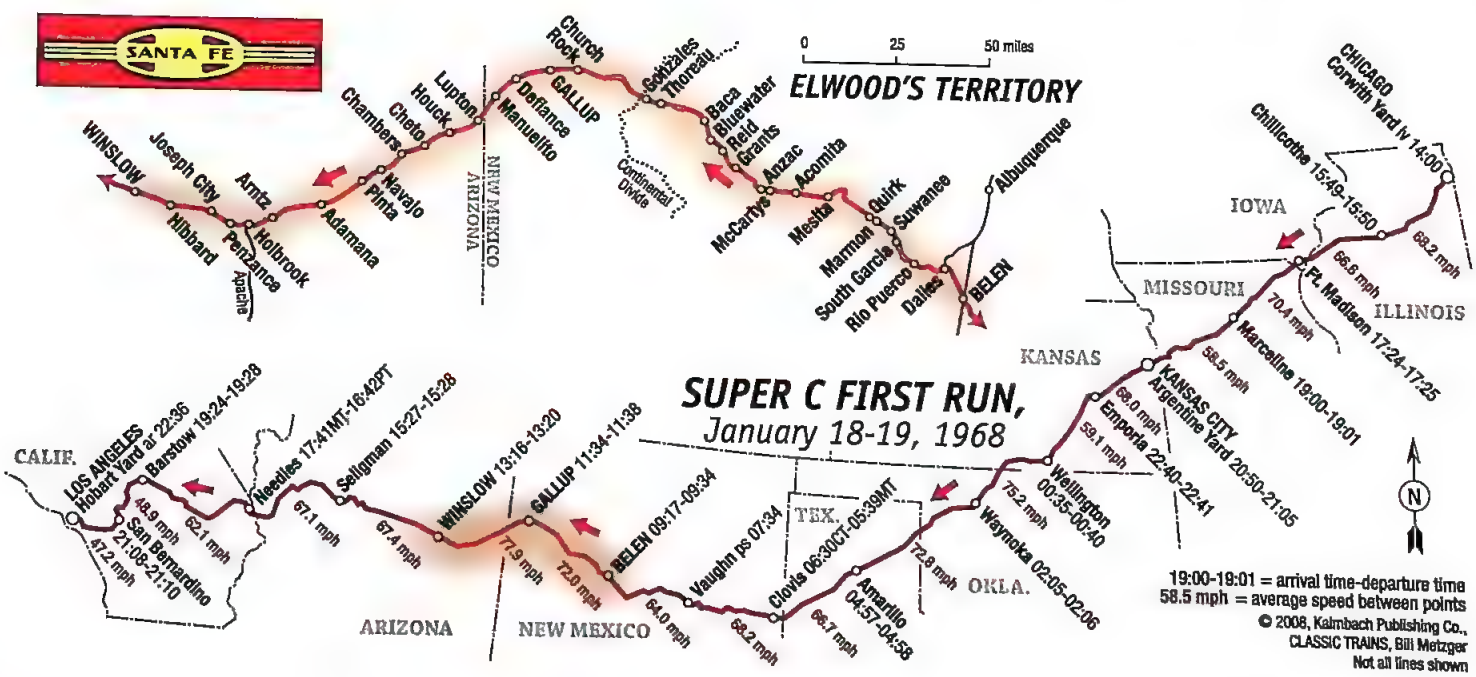
With *Super C*, we used every possible advantage to not lose even one second of time for any curves, bridges, or other restrictive conditions. This entailed waiting until the last possible moment to apply the train brakes to achieve the desired speed at the location where required, and also to increase the throttle as the caboose came out of the restriction so top speed would be regained with minimum loss of time. Engineers used every technique they'd learned by experience to contribute to *Super C*'s record running time.

Why use the train's air brakes instead of the dynamic brakes on the locomotives? The short answer is that it is a matter of time. Santa Fe's rule for the use of dynam-



STEVE PATTERSON

V.P.-Operations Raymond D. Shelton rides trailing unit 102 into the Illinois sunset.



Testing one, two, three

CLOCKWISE FROM ABOVE: STEVE PATTERSON; SANTA FE RAILWAY; JIM McCLELLAN

Four GE U28CG's lead the first test run (above) west near Williams, Ariz., on May 27, 1968. The coast-to-coast test (top left) cruises near Flagstaff on June 10. The K.C.–Winslow run meets No. 24, the *Grand Canyon*, at Omega, Colo. (above), 3 miles west of La Junta.

As the premium, fast transcontinental intermodal service that would become *Super C* came together, Santa Fe and New York Central planners kept in touch. To test their ambitious notion, a dedicated train on a 60-hour schedule, Presidents John Reed and Alfred Perlman authorized a train from New York to Los Angeles. Reed, in fact, approved two—one with NYC using Flexi-Vans and one over just Santa Fe's portion, with TOFC cars.

The first test, on May 26, 1967, was Santa Fe's. Extra 358 West left Corwith Yard at 10 a.m. with U28CG's 358, 355, 356, and 359, dynamometer car 5015, business car 20, 20 flatcars with 40 trailers, and a caboose—1,744 tons. Horsepower per ton was 6.4. Speed was held to 70 mph as the stability of TOFC cars was observed, then raised to 79, and—beyond Belen—to 90. It pulled into Hobart Yard at 9:33 p.m., May 27—a 37-hour 33-minute run averaging 58.7 mph . . . within an hour of the all-time record, set by the inaugural of the first lightweight *Super Chief* on May 18-19, 1937. That was enough for John Reed. On June 1, he announced Santa Fe would inaugurate a 40-hour Chicago–L.A. freight.

This set the stage for the coast-to-coast test. Four NYC GP40's, led by 3024, pulled 18 loaded Flexi-Van flats and a rider coach—1,235 tons—from 30th Street in Manhattan at 10:24 p.m. on June 8. "We figured to get to Chicago in 14 hours," said Jim McClellan, then with NYC, "but we got so screwed up." The run was jinxed—routed through Selkirk Yard near Albany instead of kept to the passenger main; held at Toledo for two trains; and having to negotiate top speed (70 or 80 mph) on each division. What should've been a 70-minute run around Chicago on the Indiana Harbor Belt took twice as long. It reached McCook, Ill., and Santa Fe interchange at 4:15 p.m., 18 hours 51 minutes from Manhattan—only 51.1 mph. Even at that late date, NYC's *20th Century Limited* covered its 961 miles in 16 hours. Departure from McCook, with the same four ATSF U28CG's and dynamometer car, plus business car 29 and a caboose, was at 4:59 p.m.

They made history: Chicago–L.A., 2,197.5 miles, in 34 hours 46 minutes, 63.2 mph. New York–L.A. was 3,160.9 miles in 54 hours 21 minutes, 58.2 mph, easily topping Union Pacific M-10001's record of 56 hours 55 minutes set in 1934 [see pages 82-91].

One final test train ran that summer, to try the Northern Division routing via La Junta Colo., which had less congestion and 509 miles of 90-mph track. The train left Argentine on July 11 with the same four U28CG's and dynamometer car, business car 36, 20 loaded TOFC cars, and a caboose—1,746 tons. It averaged 59.1 mph on its 1,166.1-mile trip, which ended in Winslow at 5:36 a.m., July 12, but was 1 hour 12 minutes slower than Test Run 1, via Amarillo, over a route only 20.1 miles longer.—*Fred W. Frailey (excerpted from his May 1986 TRAINS article, "Super C")*

STEVE PATTERSON

Four SD45-2's totaling a rated 14,400 h.p. roll the westbound *Super C* toward Kingman, Ariz., on March 13, 1975. At today's diesel fuel prices, can you imagine such an overpowered train—even a short, super-fast premium intermodal service?

ic braking was: 1) Reduce the power throttle to idle position; 2) Transition lever in position 1 for at least 10 seconds, before transition lever is moved to off position for not less than 5 seconds, then move into braking zone; and 3) Leave in braking position for not less than 5 seconds, before moving farther into braking zone.

By going through this procedure at every slowdown location, then following the reverse procedure to release the braking force, you would lose substantial running time. So except for long descending grades, such as California's Cajon Pass and two places on the 1st District of the Albuquerque Division, dynamic braking is not practical for use on *Super C*, even though Santa Fe's rule states that the dynamic brake must be considered as

FRANK AND TODD NOVAK COLLECTION

As a scheduled service, *Super C* ran, even when business was slack, as evidenced by F7 340 with this minimum consist at Joliet, Ill., in the mid-1970's. It lasted eight years.

primary braking force.

We are out of Quirk and have about 6 miles to another restricted-speed curve, 65 mph, at Laguna. Our speed resumes through Acomita and McCartys to MP 84, just west of McCarty's, where we are faced with eleven 55-mph curves before reaching Anzac. So, in advance of MP 84, I start the air-braking process. At MP 88.5, between Anzac and Grants, is another 55-mph curve. After negotiating that one, we are again making 90 through Grants, and on through Reid, Blue Water, and Baca, where the main tracks again split owing to grade conditions. They're separated through South Chaves to Thoreau, where they temporarily rejoin. Five miles west of Thoreau is the siding and station of Gonzales, the Continental Divide.

We top the grade at 90, and the main tracks again separate; this time, the eastbound curves to the north. Just prior to the crest of the divide, I shut down the throttle since we are approaching the downgrade, which extends 28.3 miles to Gallup. For the long downhill run, I take advantage of the dynamic brake, because it will do a good job of maintaining 90, and we will lose no time using this procedure here. About 2 miles from the yard limit board for Gallup, I set about 12 pounds of air, then release the dynamic brakes and control the train speed with the train air brakes through Gallup.

During 1967 and 1968, we changed crews at the Gallup yard office "on the fly," that is, we reduced train speed to 2 or 3 mph, at which point the outbound crew boarded and took control of the train, and then the inbound crew would disembark. This also was done elsewhere on the Santa Fe, but Gallup was the only crew change point on the Coast Lines where it was done. It was subsequently discontinued for safety reasons.

As we approach Gallup, a voice over the radio from the caboose says we are to stop at Gallup because Raymond D. Shelton, our operating vice president out of Chicago, wants to walk forward from the caboose to the business car *Topeka* to ride. This means there will be no moving crew change, which costs us a tad of running time. My guess is that Mr. Shelton had been riding the rear end at the maximum speed of 79 mph, but when 90 became the norm, he thought the business car would give him a more comfortable ride.

Our total time for the 141-mile 1st District was just about 2 hours flat, an average of better than 70 mph.

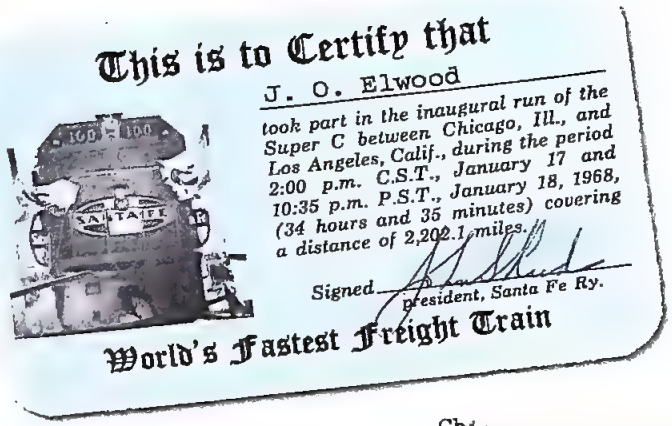
2ND DISTRICT RACETRACK

When our operating vice president is safely aboard the business car and the 2nd District crew is ready, we leave Gallup, doing 30 mph within the yard limits until reaching MP 161. As the engines pass the milepost I have the throttle in Run 8, and shortly we are again doing 90.

Westward, the 2nd District is "the racetrack," 127 miles of descending grade with only two curves carrying speed restrictions. Leaving Gallup, the first siding is Defiance, then Manuelito. The

STEVE PATTERSON

Bicentennial-decorated SD45-2 5700 leads three sisters on the "891 train," *Super C* eastbound, at Ludlow, Calif., July 20, 1975.


This is to Certify that
J. O. Elwood
took part in the inaugural run of the Super C between Chicago, Ill., and Los Angeles, Calif., during the period 2:00 p.m. C.S.T., January 17 and 10:35 p.m. P.S.T., January 18, 1968, (34 hours and 35 minutes) covering a distance of 2,202.1 miles.
Signed
President, Santa Fe Ry.
World's Fastest Freight Train
Chicago, July 10, 1968
Mr. J. O. Elwood:
For some time I have been wanting to thank each of you who took part in the inaugural run of the Super C, the world's fastest freight train.
The Super C broke all records and the attached souvenir card, made out in your name, will certify that fact. My personal thanks for your fine cooperation.
John S. Reed

Santa Fe showed its customary class in recognizing employee contributions "to the cause," evidenced in the case of *Super C* by this souvenir certificate card and personal note from President John S. Reed, prized mementos in author Jack Elwood's collection.

Arizona state line is at MP 179.5, and Lupton is at 180.4. At 90 mph, a milepost flashes by every 40 seconds. I have reduced the throttle to Run 3 or 4, as the descending grade allows me to easily maintain 90.

The noise level has also diminished, and the locomotives seem to create a floating sensation. The stations keep flying by—Houck, Cheto, Chambers, Navajo, Pinta, Adamana (location of the petrified forest). We next pass Arntz, and approaching MP 252, it's time to go to work and set the train brakes for the 60-mph curve going into Holbrook. After Holbrook, where short line Apache Railway comes in on our left, I increase the throttle to get us back up to 90. We fly through Penzance, Joseph City, and then Hibbard, with its 60-mph curve. Hibbard is the last station before Winslow.

We are now only 11.5 miles from Winslow and soon are again making 90 mph. The Winslow yard limits are at MP 284.5, so about 3 miles from the board, I reduce the throttle to Run 1 and set about 12 pounds of air to reduce our speed, all the time watching the speed recorder and increasing the set of the brakes to have our speed at 25 mph passing the yard limit board. I release the brakes at a point where I will maintain 25 to the west end of the fuel rack in Winslow, bringing the train to a stop with a final set of the brakes.

All too soon, it is time to climb down off the first *Super C*. We've made our 127-mile run over the 2nd District in 1 hour 38 minutes, including the short delay at Gallup. That's an average speed of about 78 mph, the highest in the train's almost 2,200-mile dash from Chicago to Los Angeles. The train went on to Los Angeles, tying up in Hobart Yard at 10:36 p.m. on January 18, with a total elapsed time of 34 hours 35 minutes 10 seconds, Chicago to Los Angeles. This beat the time of the second pre-inaugural test train by 11 minutes.

From an operational standpoint, the *Super C* was the super-reliable, super-fast freight train it was intended to be—an outstanding success. From a commercial standpoint, though, it never achieved the goal set for it. Nevertheless, for the 8 years, 4 months, 13 hours, 29 minutes, and 50 seconds the service operated, *Super C* was the hottest hotshot on the Santa Fe, and a source of pride for all employees. Those of us who were involved with the testing and daily operation of "Mr. Reed's Baby" were proud that we helped make it happen. It set the standard for sustained speed that no other freight has surpassed, earning the title "World's Fastest Freight Train," which it retains to this day. ■

Speed Bursts

GTW: Canada's fast Chicago connection

Grand Trunk Western train 20, the Toronto-bound *Maple Leaf,* hurries past Sedley, Ind., in late 1953 behind 4-8-4 No. 6335. During the pre-Christmas season, 20's mail and express cars were handled ahead on a passenger extra, allowing 20 to preserve its 7 hour 5 minute schedule over the 333.7 miles from Chicago to Port Huron, Mich. GTW raised its 70-mph passenger speed limit to 79 in the late 1950's. The CN subsidiary's reputation as a fast railroad came in freight service—engineers on hotshots 490 and 492 were known to liberally interpret the 60-mph freight speed limit. Until dieselization of the Chicago Division in April 1957, 492 (which picked up bananas off Illinois Central at Harvey, Ill.) remained powered by 4-8-4's like 6335 because they had ample horsepower reserves and lacked the inconvenience of a gearing limit. Double track almost all the way, plus a flat profile with few restricting curves, aided high average freight speeds; train 20 here is on the only bit of single track, 5.5 miles from Sedley into Valparaiso.

FRANK AND TODD NOVAK COLLECTION

FIELD
C.O.
DN
HEAD
LIGHT
SW.

Cab signals were one of the systems that enabled higher-speed operations. Here, a wayside signal's "clear" indication is reproduced in the cab of a GG1 electric.

PENNSYLVANIA RAILROAD; A. F. SOZIO

SPEED, SIGNALS, AND SAFETY

How railroads and regulators worked to make fast trains safer

BY **MICHAEL W. BLASZAK**

The weather on the evening of February 27, 1921, at the busy railroad junction of Porter, Ind., was calm and clear. Westbound New York Central passenger train 151, the *Interstate Express* behind K-2a Pacific 4828, was approaching the Porter interlocking on the three-track NYC main at about 50 mph, on the last lap of its trek from Buffalo to Chicago.

Inside PO Tower at the Michigan Central crossing, a buzzer sounded to herald train 151's approach. Following the first-come, first-served rule at this location, the leverman lined 151 through the interlocking, setting signals and derails against conflicting movements on the MC. With the blade of the home signal semaphore pointing skyward, the NYC engineer prepared to charge over the diamonds at timetable speed.

Simultaneously, MC train 20, the *Canadian* bound for Detroit, Toronto, and Montreal, was storming east toward Porter. As K-3f Pacific 8306 drew its nine cars filled with overnight business travelers and Chicago day-trippers around the curve west of the NYC diamonds, the fireman called to the engineer that the home signal was "all the way." The engineer interpreted that as a clear indication. "All right," he replied, and kept his train rolling eastward at about 40 mph.

In reality, the home signal was red, protecting the movement of NYC 151. MC 20 banged through the split-frog derail protecting the Central's movement and bounced about 300 feet along the ties before miraculously rerailing at the crossing frogs. The engine and two of the cars made it across the NYC before train 151, which was unable to stop, plowed through the third car, wooden Canadian Pacific coach 1560.

"The impact of the New York Central engine was so great that the day coach was reduced to a mass of splinters," *Railway Age* reported. The head-end crewmen of NYC 151 were killed, along with 35 of the unfortunate

WESTCHESTER (IND.) TOWNSHIP HISTORY MUSEUM

The disastrous February 27, 1921, collision of two trains at Porter, Ind., led the government to order ATS or ATC on passenger lines.

occupants of CP coach 1560, who were "mostly decapitated." Twenty others were injured. At the subsequent investigation, the MC engineer claimed that he had confused PO Tower's green train-order light with the home signal for the interlocking.

"This accident," the Interstate Commerce Commission's Bureau of Safety reported, "again calls attention to the necessity for an automatic train control device to be used in connection with existing equipment."

EARLY EFFORTS AT AUTOMATION

Although the railroad industry had made great strides in safety through innovations such as air brakes, knuckle couplers, and steel-bodied passenger cars, accidents resulting from the collision and derailment of trains continued to plague the carriers during the early years of the 20th century. Not only could such mishaps be financially ruinous due to disruption of operations and expense to settle the resulting death and injury claims, but also the gruesome reporting of passenger carnage in the popular press increased political pressure for government oversight in an era when regulation of all facets of railroading was in its ascendancy.

Congress took the first step toward reducing the human and financial toll of collisions on June 30, 1906, when it directed the ICC "to investigate and report on the use of and necessity for block signal systems and appliances for the automatic control of railway trains." With $50,000 appropriated the following March, the ICC assembled a panel of railroad and supplier experts known as the block signal and train control board to explore "automatic appliances for control of railway trains."

The prosperous early years of the 20th century saw substantial growth in rail traffic. The railroads invested millions in additional capacity to carry their burgeoning business, famously including such projects as Pennsylvania Station and its system of access tunnels in New York and the vast upgrading of the western railroads controlled by E. H. Harriman.

Less prominent but equally significant was the spread of automatic block signal systems along main lines. Block signals told engine crews whether the track ahead was intact or occupied by another train, allowing them to stop before hitting the obstruction. While safety was an important incentive to install the new signals, increasing capacity was the primary reason the railroads invested in this equipment. Historically, trains had been operated primarily by timetable and train orders issued by station agents and tower operators under the telegraphic direction of dispatchers. Automatic block signals allowed more than one train at a time to operate safely between these control points, so long as the signals were obeyed.

Unfortunately, crews did not always follow the signals, and their mistakes, like that of MC 20's engineer, were often deadly. Sometimes the head-end crew could not see the signals in time to prevent disaster, because of curvature, grades, or weather conditions such as rain or fog. Even when visibility was good, crews sometimes ran through restricting indications when they were distracted or had fallen asleep. The block signal and train control board focused its efforts on new systems that would prevent trains from colliding, whether the engine crew was obeying signal indications or not.

In 1907, no such technology was available, but four years of research and experimentation led the board to report in 1911 that systems to stop trains automatically did not "involve any new principles, nor are they materially different from the elements used by the railroads in the everyday operating of their interlocking and block signals, train brakes, and other devices." Though the railroads had been "decidedly lax" in pursuing this goal, the board counseled Congress to give the industry a chance to "develop the art of automatic train control" on its own, taking steps "to stimulate such action" only if the roads failed to act with "a reasonable degree of expedition."

Congress took the board's advice, but the industry as a whole ignored it. Unlike block signals, train control did little to improve the railroads' bottom line, apart from the unquantifiable benefit of reducing accidents. Only three pioneering installations of collision-avoidance systems were

ROCK ISLAND

LOUIS A. MARRE COLLECTION

An early train-control installation was the Rock Island's ramp system of 1920. Above, a hostler checks an E unit's pick-up apparatus, located between the first and second axles on the front truck (upper right). A view of the *Golden State Limited* near Annawan, Ill. (right), shows a block signal and, in the foreground, its associated trackside ramp.

CLASSIC TRAINS COLLECTION

made in the ensuing nine years. First to act was the Chicago & Eastern Illinois, which put a "ramp-type" train-stop system in service along its double-track main line between Yard Center (Dolton) and Danville, Ill., 105.4 miles, on November 1, 1914. This apparatus transmitted signal indications to locomotives electrically through contact between the 175 trackside ramps and shoes on the locomotives or tenders. If the upcoming signal required a stop, the system would apply the train's air brakes automatically.

Chesapeake & Ohio followed suit, activating a ramp system on seven miles of single-track main line between Gordonsville and Charlottesville, Va., in March 1917. Over the next several years this system was extended to Staunton. The Rock Island began a more ambitious program in March 1920, installing a ramp system on its 22.4-mile, block-signaled, double-track main line between Blue Island and Joliet, Ill., which eventually was extended 120 miles west to Rock Island, Ill. In addition to stopping trains that entered occupied blocks, RI's more advanced system also slowed trains moving at higher than authorized speed through blocks where the signal displayed a restricting, but not a stop, indication.

Although these initial installations worked, with minuscule failure rates, the railroads' reluctance to invest more aggressively in accident-avoidance technology induced Congress to include a provision in the Transportation Act of 1920 empowering the ICC to "order any carrier subject to this act, within a time specified in the order, to install automatic train-stop or train-control devices . . . upon the whole or any part of this railroad . . ."

ICC PUSHES THE SAFETY ISSUE

On January 10, 1922, the ICC, driven by continued disasters like the Porter wreck, began to force the issue, directing 49 railroads to show cause why an order should not be entered requiring them to begin installing ATS or ATC systems. The railroads made several arguments against the threatened mandate: The technology was unproven, ramps would not fit in third-rail territory on electrified lines, snow and ice would prevent contact between ramp and shoe, and snowplows would demolish the

ramps. The primary objection, though, was that the roads could not justify the cost of the new systems on economic grounds, preferring to concentrate capital investment in additional main tracks, more block signals, grade separations, and other improvements that not only would make their operations safer, but also would increase their efficiency, capacity, and profitability.

In its order dated June 13, 1922, the ICC dispensed with these objections. Railroads wary of the physical contact on which the ramp system relied, or preferring not to install ramps because of clearances or weather concerns, could look into the new magnetic induction train-control system then being installed by the Pennsylvania Railroad on 52 miles of secondary main line between Lewistown and Sunbury, Pa. The capital expense of ATS was adjudged to be manageable: $700 to $1,500 per mile of single track. Comparing that to the cost of the 26,297 head-on and rear-end collisions that had been reported during the 16 years between 1906 and 1921, which killed 4,326 people and injured 60,682, the ICC concluded "[t]he time has now arrived when the carriers should be required to select and install such device or devices as will meet our specifications and requirements."

Each of the railroads in the case was ordered to install ATS or ATC "over at least one full passenger locomotive division" on the main lines listed in the ICC decision. Without exception, these were important routes, such as Louisville to Birmingham for the Louisville & Nashville, Chicago to Omaha for the Burlington and Chicago & North Western, and Oakland to Sacramento for the Southern Pacific. Plans had to be filed by January 1, 1923, and the systems had to be operational by January 1, 1925.

Continuing its safety push, the ICC entered a second order on January 14, 1924, directing 47 of the 49 railroads involved in the first case to install ATS or ATC on a second division by February 1, 1926, and ordering 45 more railroads to do the same on one division by that date. Though a few of the first group of roads (Santa Fe; Southern Pacific; Lackawanna; Reading; Norfolk & Western; and Southern's Cincinnati, New Orleans & Texas Pacific) obeyed the 1922 order by overlaying ATS or ATC on one

H. M. STANGE; KRAMBLES-PETERSON ARCHIVE

NYC Hudson 5288 is about to pass over a tie-mounted intermittent ATS inductor at New Carlisle, Ind., on October 11, 1952.

division, most of the companies continued to drag their feet, grumbling that the new technology remained unproved and they could not afford to tie up their main lines with a train-control system that didn't work.

On March 3, 1924, the railroads took their grievances to the ICC, asking the agency to rescind the January 1924 order and to extend the time for compliance with the 1922 order. They took the position that a railroad that did not want to install a ramp system should not be forced to do so, and that the bugs had yet to be worked out of the newer magnetic induction devices.

WILLIAM D. MIDDLETON

Receiver shoes for intermittent inductive ATS and ATC were located on steam-locomotive tenders or on the front trucks of diesel locomotives, as on ACL F7 420.

Though the ICC complained that the railroads probably would have resolved the technical issues they raised if they had complied more diligently with the 1922 order, it agreed to indefinitely extend the effective date of the January 1924 order with respect to the second group of railroads and to allow the first group to continue evaluating the induction systems through a series of test installations.

Even that partial reprieve didn't satisfy some of the roads. The Delaware & Hudson, one of the 49 railroads named in the ICC's 1922 order, challenged the 1924 decision in federal court, but the judges backed the order in full, doing nothing more than extending D&H's compliance date until 1926. The other roads, no doubt prodded by the $100 per day penalty for noncompliance with the 1922 and 1924 orders, grudgingly began to install train-stop and train-control systems on their lines, with one exception: Kansas City Southern won a reprieve in 1926 covering its main line between Kansas City and Pittsburg, Kans., because of its light traffic density (four passenger and nine freight trains per day), good safety record, and precarious financial condition. The ICC published 70 decisions approving such installations from 1923 through 1928. By May 1, 1928, 11,239 route-miles had been protected by train-stop or train-control apparatus (2,841 of which had been installed voluntarily), and 8,361 locomotives had been equipped to interface with the new systems at a total cost of $26,363,000.

CARRIERS WIN A ROUND

In 1927 the ICC commenced a new proceeding to review the effectiveness of these installations. The agency found that "there had been substantial decreases in the number of accidents and casualties" in recent years, and failures such as false clears and undesired stops had also declined as the railroads corrected installation errors. Nonetheless, the industry continued to oppose expansion of automatic protection, arguing that train stop and train control was too costly for the assertedly slim benefits realized and that the capital and maintenance expense would be better directed toward expanding block signals and signalizing, grade-separating, or eliminating highway-railroad crossings, where the number of deaths and injuries from collisions had roughly tripled between 1923 and 1927.

The ICC's November 26, 1928, decision, reconsidering its previous directives, analyzed the data and found that "the number of accidents and casualties which result from the disregard of fixed signal indications is relatively small," and therefore the railroads were right to suggest that "vigorous efforts to provide adequate protection" against other perils represented a wiser use of the industry's limited capital resources. Thus, the ICC "concluded not to require by order at the present time further installations of train stop or train control devices."

The railroads were directed to work on standardizing their automatic protection to promote safe operations over jointly used track and in terminals, and the Pennsylvania was encouraged to continue its development of the "coder" system for cab signals—a new development—in its expanding electrified territory. Over time, PRR activated cab signals over much of its high-density territory, and the technology it developed was adopted by most other U.S. railroads investing in similar signaling.

The Great Depression stunted railroad investment in signal systems, but brought on a new trend with important safety implications—the advent of faster passenger service to compete with the pervasive automobile and nascent airline industry. Curves were superelevated and rail and ties replaced to allow the new *Zephyr*, *Hiawatha*, and *City* streamliners to lop hours off previous schedules. Redball freights such as the Rutland's *Whippet* and Cotton Belt's *Blue Streak Merchandise* also were introduced to meet truck competition. Of course, faster running speeds reduced the time the head-end crew had to react to restrictive block signals, broken rails, washouts, and other adverse conditions in territory without ATS or ATC protection and magnified the consequences of their errors. Some schedules were stretched out during World War II, but after 1945 the speed competition resumed.

WRECK PROMPTS MORE STUDY

Then, another accident occurred with implications for speed regulations. The Burlington's 13-car train 11, the Chicago–

DON MACBE

The terrible April 25, 1946, rear-end collision of the Burlington Route's westbound *Exposition Flyer*, moving at 80 mph, with the stopped *Advance Flyer* at Naperville, Ill., likely would have been prevented by a supplemental safety system, but none was in place

Lincoln, Nebr., *Advance Flyer*, was rolling west on main track 2 through Naperville, Ill., on April 25, 1946, when its crew noticed "something was dragging" under one of its locomotive units, E7's 9920A and B. The engineer stopped the train at the Naperville station for an equipment check. Knowing that No. 39, the nine-car Chicago–Oakland *Exposition Flyer*, was running at high speed on the same track three minutes behind, the *Advance*'s brakeman hurried to the rear of the stopped train to flag down the *Exposition Flyer*.

He got 800 feet down the track before 39's fast-approaching silver diesels, E5's 9910A and B, hurtled into view around the Naperville curve. The brakeman waved his flag frantically, but when the train failed to slow down he could do nothing more than jump out of the way. Horrified, he watched the fireman open the cab door and hesitate for a second before leaping off the lead unit to his death.

The 9910A plowed into train 11's last car, Northern Pacific coach 1376, at about 80 mph, coming to rest inside that car's shattered body about 205 feet west of the point of impact. The force of the crash pushed the next car, CB&Q parlor-lounge *Mississippi*, through the table area of preceding diner *Silver Inn*, bending it "in a U-shape," according to the subsequent ICC report, and killing most of the patrons inside. Some 150 rescuers, including doctors and nurses brought to the scene by special train from Chicago, eventually climbed onto the wreckage to pull out the survivors and the remains of the less fortunate. A total of 45 persons perished; 69 were injure

The engineer of the *Exposition Flyer*, who survived the impact, later stated he had been "going too fast, I guess." He esti mated his speed at 85 mph when he saw the second automatic block signal east of Naperville drop to approach, at which point he said he put his train into emergency. Other witnesses disputed that state ment, though, and tests with a similar train consist showed that the *Exposition Flyer* should have stopped almost 1,000 fe short of the *Advance* even if the air had been dumped as the train passed that signal. There was no ATS or ATC system at this location to ensure that would happen

In December 1946, the ICC commence an investigation into whether it should order the installation of signal systems or changes in the railroads' operations to enhance safety in response to the ongoing speedup. The Commission's report, released on June 17, 1947, noted that "[t]h tendency in recent years has been greatly to increase the speeds of trains," along with the number of trains operated, givin rise to potentially dangerous operating conditions.

The ICC analyzed authorized train speeds on the 236,554 miles of track that carried passenger trains at the time. Of th 109,878 track-miles where varnish was authorized to run at 60 mph or more, 14,121 miles were equipped with ATS and ATC and 8,107 miles provided cab-signal displays to engineers. Conversely, passenger trains were permitted to operate at 6

Decoding the systems

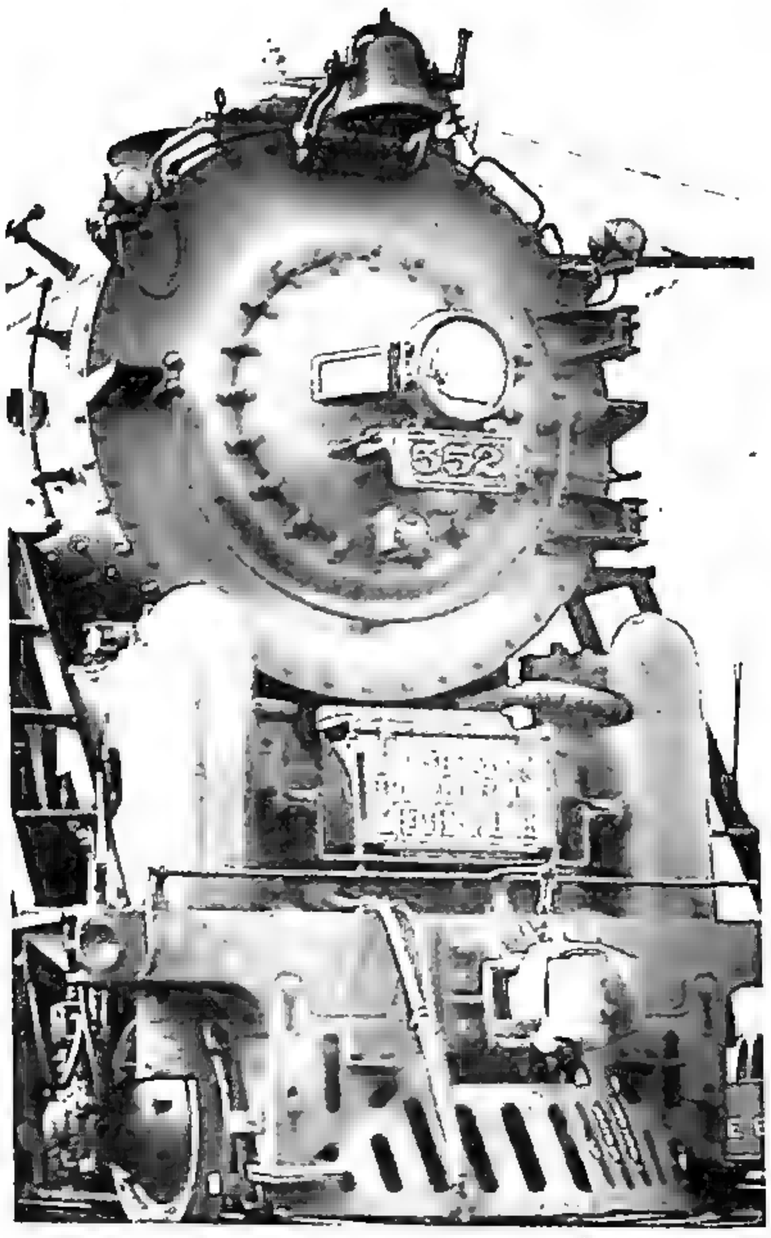
Automatic train stop (ATS): On steam railroads, most commonly an "intermittent" system based on trackside inductors located at block signals, and locomotive-mounted receivers; automatically stops a train by applying the air brakes if the train passes a restrictive signal and the engineer does not act to comply with it.

Automatic train control (ATC): A "continuous" system based on electric current in the rails, and receivers located on the underside of the locomotive; on detecting a change in track conditions ahead, automatically reduces train speed or stops the train if the engineer does not act to comply with cab-signal indications.

Cab signals: Display of wayside signal aspects via small electric-light fixtures in the locomotive cab; often but not always accompanied by ATS or ATC systems.

BURLINGTON ROUTE

In the wake of the ICC's 1947 order, which was prompted by the Naperville wreck, the Burlington installed cab signaling on its main line out of Chicago. A view in an E-unit cab shows the cab-signal display fixture (upper left, with dual displays for engineer and fireman) and small warning whistle (projecting above brake stand beyond engineer's arm).



WILLIAM P. PRICE

A 4-8-4 shows Richmond, Fredericksburg & Potomac's practice of advertising its ATC system by stenciling the boxes that housed the apparatus with the message: AUTOMATIC TRAIN CONTROL. SAFETY FIRST ALWAYS.

mph or greater over 19,550 track-miles of "dark" territory without block signals, controlled only by timetable and train orders, including 106.7 miles where speeds in excess of 90 mph were allowed.

During the 30 months between January 1944 and June 1946, the report continued, the railroads had reported 506 mainline collisions between trains. Comparing where the collisions occurred with the type of signaling and train control in place, if any, the ICC found that "the higher the degree of protection the lesser the number of collisions per mile of track operated," even though train frequency (and thus, potential for collisions) almost always was highest on trackage with automatic block signals and/or train control.

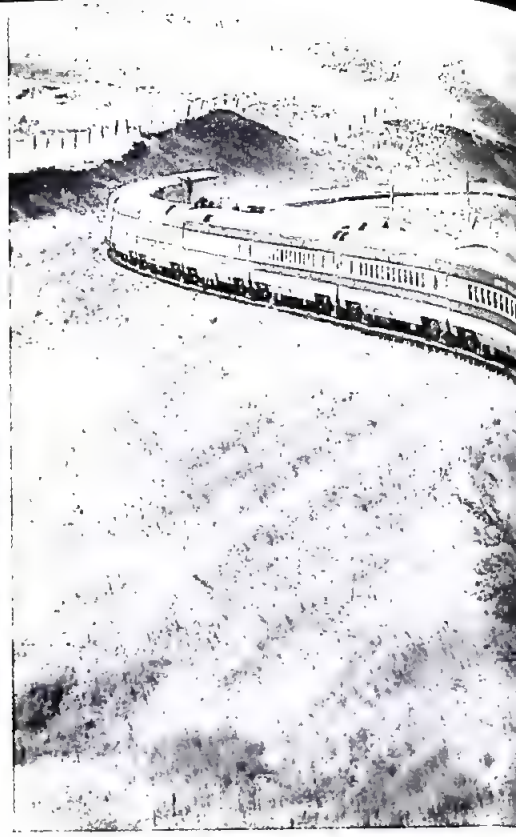
INVESTMENT CHOICES

Concluding that "it is relatively very unsafe to operate passenger trains at 60 or more miles per hour or freight trains at 50 or more miles per hour by timetable and train order only," the ICC ruled that such operations "should be under an automatic or manual block-signal system, preferably supplemented by timetables and train orders." Furthermore, "trains operated at speeds of 80 or more miles per hour should have protection in addition to" block signals, which "should be either continuous cab signals, automatic train stop or train control, or both." The railroads were ordered to comply with these requirements by 1952.

The ICC offered to modify these speed restrictions if the railroads proved unusual circumstances, and 33 railroads accepted the invitation by requesting waivers from the 79-mph speed restriction in block-signal territory. The agency generally declined these requests, though, despite some compelling arguments. Great Northern, for example, sought to maintain an 85-mph maximum speed for passenger trains over three segments of its main line totaling 398 miles in order to protect the seven-hour servicing turnaround of the *Empire Builder* in Seattle and avoid the necessity of investing $2.2 million in a sixth train consist. Representative engineers, though, testified that they had problems seeing the lineside signals when operating at high speed during winter snowstorms. Brushing aside GN's claims, the ICC decided not to modify its 1947 order "for the sole purpose of making up a maximum of 25 minutes lost time" over the territory in question.

Faced with lengthening the running times of their transcontinental streamliners to the point where additional consists might be required, Santa Fe and Union Pacific embarked on massive programs to extend ATS and cab signal protection across their main lines. Less prosperous railroads with shorter hauls often decided

IRA H. EIGSTI



Pennsy K4's and T1's routinely topped 100 mph on the Fort Wayne Division until 1947, when PRR elected not to install cab signals in response to ICC order. West of Warsaw, Ind., on August 10, 1945, a K4 rockets east with the *Liberty Limited*'s second section.

the additional investment wasn't justified. For example, where steam-powered trains had recently romped in triple-digit territory, the Pennsylvania slowed down its straight and flat Fort Wayne Division across Indiana to 75 mph to avoid the expense of extending its cab signal system. Milwaukee Road chose to save 4 to 5 million dollars by not installing block signals on secondary passenger routes to places like Rapid City, S.Dak., and Green Bay, Wis., electing instead to invest that money on signals for higher-density lines. Burlington decided to preserve its reputation for speed by overlaying cab signals on its Chicago–St. Paul and Chicago–Council Bluffs routes, but stretched out the timecard of the *Denver Zephyr* rather than extending the cab-signal project to Denver.

SPEED, AND INTEREST, DWINDLE

Completion of these ICC-encouraged signaling projects marked the high point of passenger-train speed across North America. As measured by TRAINS magazine's annual speed survey, compiled by Donald M. Steffee between 1954 and 1979, the daily mileage of passenger trains operated on route segments requiring an average speed of 60 mph or greater peaked in 1955 at 167,835. Unfortunately, the cumulative impacts of auto, bus, and air competition for passengers; inflating operating expenses; and aging equipment requiring replacement were beginning to devastate the passenger business, making competition on speed or any other basis irrelevant to railroad management.

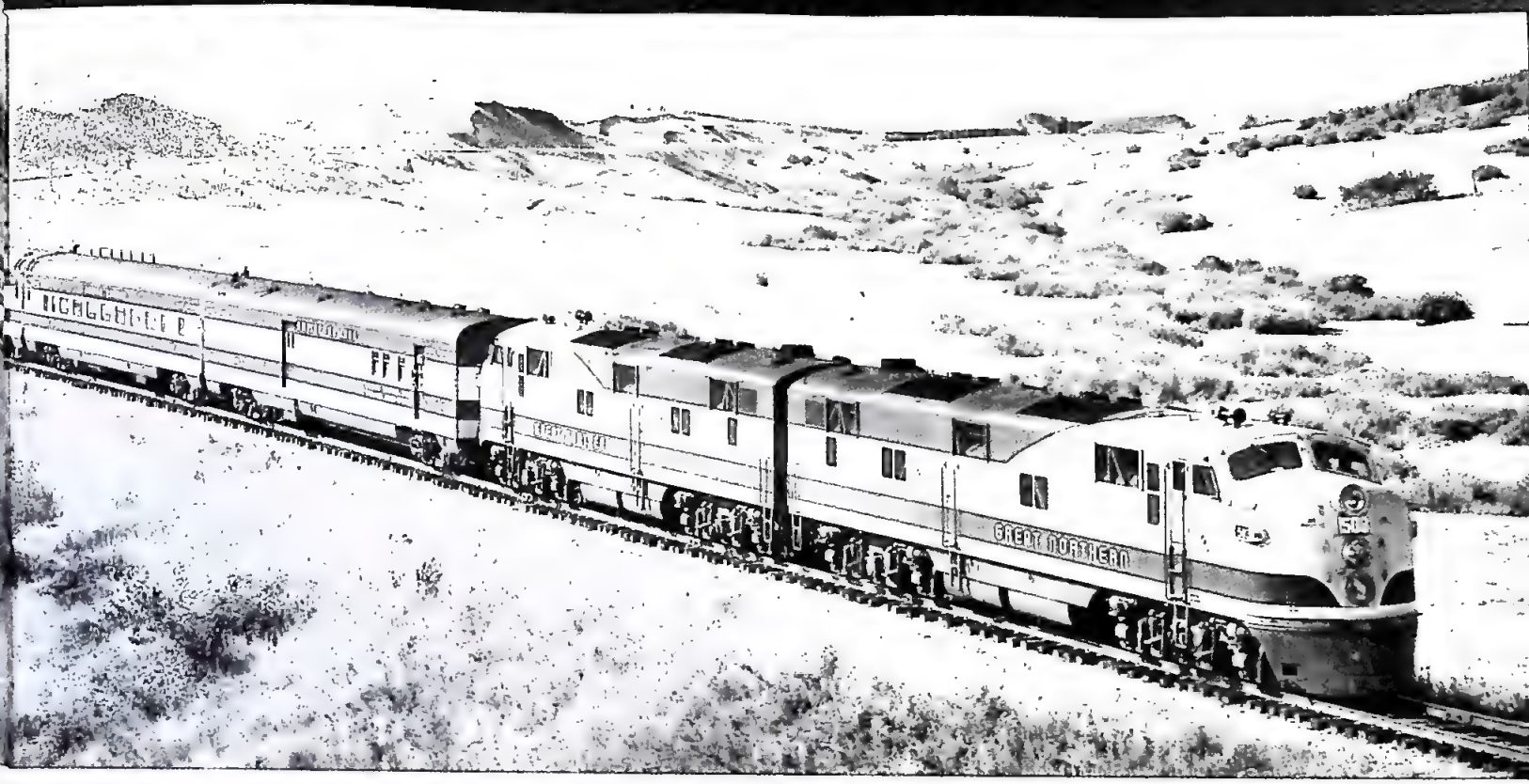
The changing economic climate became painfully obvious in 1957, when Burlington lengthened running times for the numerous passenger trains operating alongside the Mississippi River between Savanna, Ill., and St. Paul. For more than a decade, CB&Q's La Crosse Division had hosted the fastest passenger schedules in the world, requiring point-to-point averages of as much as 86.2 mph between East Dubuque, Ill., and Prairie du Chien, Wis. The recession of 1958 precipitated the discontinuance or combination of numerous trains, and the Transportation Act of that year streamlined the regulatory process for securing approval of additional train-offs.

With passenger service declining rapidly, the railroads that had been required by the ICC to install ATS and ATC systems began looking seriously at taking them out. The installations complicated operations, requiring the assignment of locomotives capable of receiving the signals to lead trains, and cost money to maintain. Moreover, management was concerned that their advancing age could lead to disastrous failures.

An accident on the New York Central at Ripley, N.Y., on February 8, 1957, underscored the threat. The Central had recently reduced its four-track main line at this location, between Buffalo and Erie, Pa., to two tracks under centralized traffic control. The dispatcher ran Extra 1704 West, a freight train, on track 2 to allow passenger train 43 to pass it on track 1. After 43 went by, Extra 1704 West crossed over from track 2 to track 1 on the Ripley crossover to avoid oncoming passenger train 74.

The setting winter sun behind train 74 shone brightly on signal 672E, the second signal on track 2 before the crossover. The signal was displaying approach, since the westbound freight was fouling the Ripley crossover switch, but because of the lighting conditions No. 74's engineer read it as clear. He relied on the Central's train-stop system, which had not reduced 74's speed, to confirm his reading. Unfortunately, water had entered the winding of the wayside inductor protecting that signal, resulting in a false clear and preventing the system from stopping the train. The engineer kept on the move until he saw that the next signal was red, and he immediately applied the brakes. But it was too late; train 74 hit the 27th car of Extra 1704 West at 28 mph.

Railroads desiring to retire their train-control systems, rather than spend the money required to rebuild them, needed the ICC's authority to do so. The agency strove to establish a balancing test, weighing the cost of operating and maintaining the installations against the risk to passengers and train crews of taking them out. A typical case was Erie Lackawanna's application to discontinue the ex-Erie ATS system between Port Jervis and Hornell, N.Y., and the ex-Lackawanna cab-signal system between Scranton, Pa., and Binghamton, N.Y., a total of 302 route-miles. The EL informed the ICC that train frequency between Hornell and Susquehanna, Pa., had declined from 26 passenger and 25 freight trains daily in 1929 to an average of 5.3 passenger and 21 freight trains daily in



GREAT NORTHERN

Great Northern protested that the ICC-mandated slowdown to 79 mph would require an extra set of equipment for the *Empire Builder*, pictured in western Montana.

1963, and that most through freight on the former Lackawanna had been moved over to the ex-Erie to take advantage of that route's more favorable grades. Noting that EL had upgraded the signals on the ex-Erie, the diesel locomotives now used on the lines offered better visibility for head-end crews than the steamers of old, and the railroad had a good safety record, the ICC found on December 28, 1964, that the record "[did] not indicate any safety reason" to retain the systems.

Some railroads had to make multiple requests. L&N asked for authority to discontinue ATC between Corbin, Ky., and Etowah, Tenn., in 1950, but was turned down. The railroad repeated the request in 1963, noting that it had placed this line under CTC and installed all new signals in 1955. Perhaps more importantly, the line had been dieselized and the number of daily passenger trains had dropped from six each way to just one. The ICC agreed that, under the changed circumstances, the ATC was "obsolete and expensive to maintain" and should be removed.

In 1963, Steffee reported in TRAINS that just eight U.S. railroads were still operating passenger trains at more than 79 mph under ATS, ATC, or cab-signal protection as required by the ICC's 1947 order. Santa Fe had by far the most high-speed territory, encompassing most of its transcontinental main line and its route to Texas, followed by UP and Atlantic Coast Line. The other roads (New Haven, Illinois Central, Milwaukee, Burlington, and Rock Island) authorized speeds over 79 on parts of just one or two divisions. (PRR at this time still had hundreds of cab-signaled miles, but, except for some 80-mph segments between New York and Washington, limited its passenger trains to 75 mph or less.) The ranks of this club continued to diminish as MILW and RI slowed down their passenger trains and Santa Fe dropped its aging ATC across Illinois between Pequot (near Joliet) and Niota (at the Mississippi River) in 1970.

AMTRAK ERA PHASE-OUTS

The advent of Amtrak in 1971 froze the decline in fast passenger-train operations over lines that were included in the initial basic system. The operating agreement negotiated by Amtrak and the railroads that elected to transfer their passenger service required the railroads to maintain the "level of utility" of their lines for the term of the contract. Thus, in addition to securing permission from the Federal Railroad Administration, which had assumed the ICC's safety functions in 1967, railroads desiring to discontinue ATS, ATC, or cab signals on Amtrak routes had to reach an agreement with the passenger carrier if the level of utility were adversely affected.

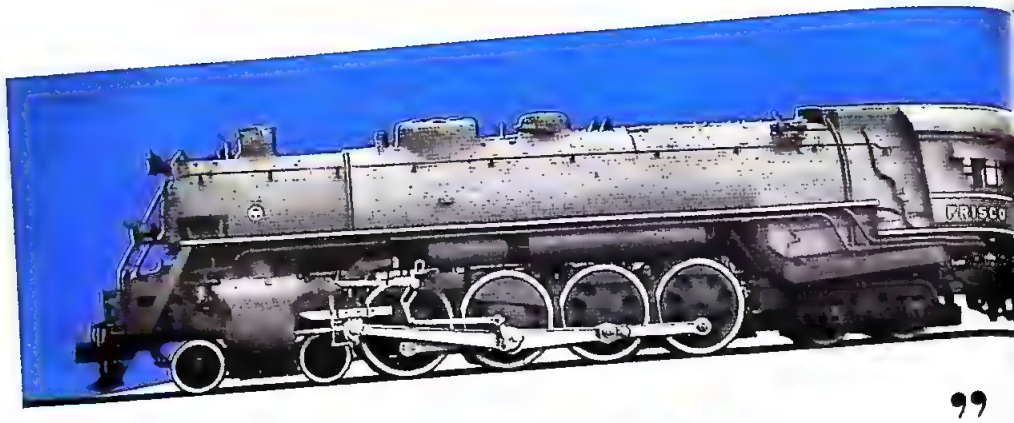
Over time, though, most of the remaining train-control installations permitting operation at more than 79 mph were phased out, as Amtrak agreed that the benefits of running over 79 were minimal compared to the costs incurred by the railroads to operate and maintain the systems. Today the *Southwest Chief* is the only long-haul train outside the Northeast Corridor authorized to operate at up to 90 mph, over parts of BNSF Railway's main line in New Mexico, Arizona, and California, where ATS installed by Santa Fe in response to the ICC's 1947 order remains in service.

The wisdom of the federal government's intervention in the realm of railroad signaling, speed, and safety can be debated. Railroad arguments against the 1922 and 1924 mandates to install train control had considerable weight. The ICC's eventual concurrence in the railroads' view saddled the industry with a patchwork of incompatible control systems that was never completed, the expense of which precluded other improvements that may have enhanced both safety and profitability. The 1947 order restricting passenger-train speeds to 79 mph unless ATS, ATC, or cab signals were operating, and particularly the agency's rigid application of that rule, may have marginally affected the railroads' efforts to make a go of the service, although it is clear that larger trends would have swamped the streamliners anyway.

On the other hand, it will never be known how many disasters similar to the Porter and Naperville wrecks were averted by the government's actions. It's entirely possible that some readers of this article may be alive only because, many years ago, a train stop, train control, or cab signal system prevented a collision or derailment that saved the life of a train-riding ancestor. ■

Speed Bursts

In steam they trusted

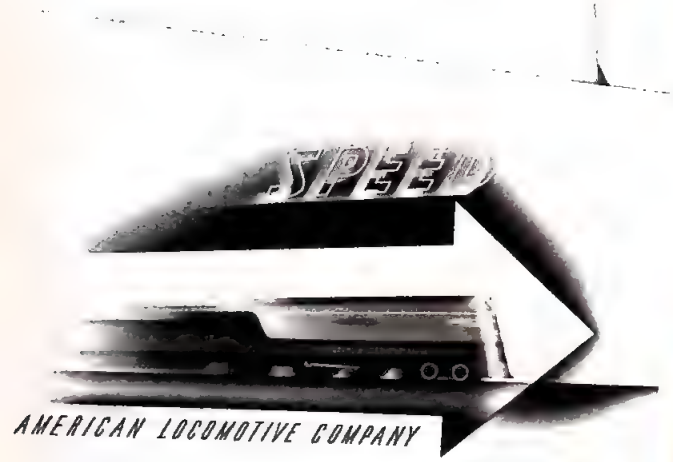


"Frisco Faster Freight"

Serving both the Southeast and Southwest, the lines of the St. Louis-San Francisco Railway stretch from Birmingham, Alabama, to western Texas; from Kansas City and St. Louis to Pensacola on the Gulf. "Frisco Faster Freight" is the railway's symbol of service to this great link in transcontinental and export shipping. Fifteen Baldwin 4-8-4 type locomotives, built in 1942, have been placed in dual freight and passenger service, helping the Frisco to haul the men and materials needed for victory.

These modern locomotives are operating on the Eastern Division from St. Louis, to Monett, Missouri, and over the Southwestern Division to Tulsa, Oklahoma. In this service they have joined heavy Mountain type locomotives, thus permitting the release of a number of Mikados and medium weight Mountain type locomotives for service on other divisions.

Baldwin locomotives, as well as Baldwin military tanks, guns and other war materiel, are aiding America in the all-important task of winning the war.



Baldwin serves the Nation which the Railroads helped to Build

IF IT'S SPEED
you want . . .

. . . steam will give it

While speed is the essence of modern train operation, speed alone is not enough.

Your motive power must furnish the desired speed at low operative cost plus moderate maintenance and reasonable initial investment.

In any service, today's high standard of train operation can be maintained at the lowest possible cost only by utilization of modern steam power.

LIMA LOCOMOTIVE WORKS INCORPORATED

LOCOMOTIVE WORKS, INCORPORATED, LIMA, OHIO

THREE ADS, JEFF HAMPTON COLLECTION

The steam era's Big Three locomotive builders—Alco, Baldwin, and Lima—were understandably slow to embrace the diesel. Besides being the technology on which they'd built their fortunes, steam did have some advantages over diesels, especially in high-speed service, thanks to the fact that a steam locomotive's power output increases with speed. In three advertisements from *Railway Age* magazine, the builders promote their external-combustion products. Alco's ad (far left, from the November 11, 1939, issue) features a Milwaukee Road class A 4-4-2; Baldwin (left, February 27, 1943) showcases a Frisco 4-8-4; and Lima (above, August 19, 1939) spotlights a Southern Pacific *Daylight* 4-8-4.

HUDSONS

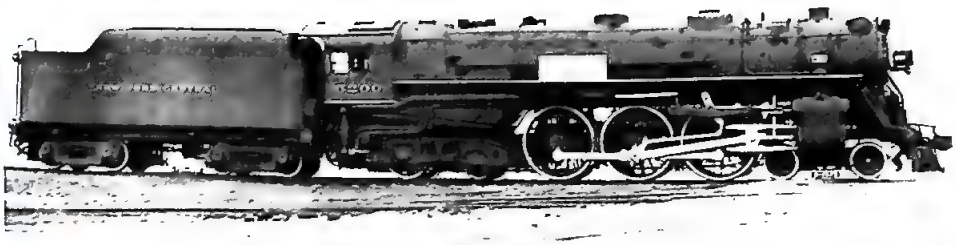
Powerful passenger speedsters

The 4-6-4 type was a varnish star on more than a dozen railroads

BY **NEIL CARLSON**

...ough they weren't the biggest, fast-... or last Hudsons, New York Central's ...'s are considered the epitome of ...-4 design. No. 5433 has South Bend, Ind., in her sights as she races east with a secondary train in November 1950.

GEORGE KRAMBLES; KRAMBLES-PETERSON ARCHIVE



TWO PHOTOS, CLASSIC TRAINS COLLECTION

Alco and NYC unveiled J-1a No. 5200—the first Hudson—on Valentine's Day, 1927. The ceremonies were justified, as the road ordered 264 more 4-6-4's from the builder. The prototype's small tender was replaced by a 12-wheel version on the production models.

In writing a history of the 4-6-4, or Hudson type, it's tempting to simply describe it as a New York Central, Canadian Pacific, and Alco story. The NYC and CP together owned 340 of the 487 Hudsons built for service in North America. American Locomotive Co. (Alco)—including Canadian subsidiary Montreal Locomotive Works—built 397 of them. While these statistics dominate, more than a dozen other railroads operated 4-6-4's. Some were high-wheeled super-speedsters, some were streamlined, and still others handled everyday passenger trains. There were even a few "welterweights" that would have been Pacifics on railroads with heavier axle loadings. The complete story offers a fascinating tale about the need for a modern, high-capacity passenger engine and the resulting effort that led to the creation of a new locomotive type that served many railroads and powered some of the nation's finest and fastest trains.

The 4-6-2 Pacific type was introduced in the first few years of the 20th century to cope with the heavier, all-steel passenger cars being introduced at the time. Compared with the 4-6-0's and 4-4-2's it replaced, the 4-6-2 had a large, deep firebox situated behind the rear driving wheels and supported by a two-wheel trailing truck. With its larger grate and more furnace volume, this firebox offered very good combustion conditions. Additionally, the Pacific's long boiler gave it 50 percent more heating surface than earlier engines. The result was a locomotive that had both greater tractive effort and more horsepower than its predecessors. It could pull heavier trains on existing schedules or expedite existing trains on yet faster schedules. The Pacific grew to become the passenger locomotive of choice for most mainline railroads, and into the 1920's it epitomized the state of the art of steam passenger locomotive development.

The motive-power situation on the New York Central mirrored the national trend. The railroad bought its first Pacific in 1903, eventually acquiring 368 in several classes. The newest was the class K-5, and it was a modern machine. The Central had many important trains, including the *20th Century Limited*, *Empire State Express*, and *Southwestern Limited*. These popular trains had grown in size, and their schedules had been accelerated many times. However, by the mid-1920's they had reached the point where they were beyond the capability of a single Pacific—even a big K-5. Doubleheading and second sections had become all too common. The

HUDSON SPECIFICATIONS: A SAMPLING OF CLASSES

	THE FIRST			LATE 1920's					HIGH-WHEELERS		
Railroad	**NYC**	**NKP**	**ATSF**	**CPR**	**MILW**	**CB&Q**	**CN**	**MEC**	**ATSF**	**C&NW**	**MILW**
Class	J-1	L-1a	3450	H-1a	F-6	S-4	K-5a	D	3460	E-4	F7
Road numbers	5200-5404	170-173	3450-59	2800-09	6400-13	3000-11	5700-04	701-702	3460-65	4001-09	100-105
Builder	Alco	Alco	Baldwin	Montreal	Baldwin	Baldwin	Montreal	Baldwin	Baldwin	Alco	Alco
Year	1927-31	1927	1927	1929	1930	1930	1930	1930	1937	1938	1938
Cylinders:											
bore x stroke (in.)	25x28	25x26	25x28	22x30	26x28	25x28	23x28	23x28	23½x29½	25x29	23½x30
valve gear	Wals./Baker	Wals.	Wals.	Wals.	Baker	Baker	Baker	Baker	Wals.	Baker	Wals.
valve dia. (in.)	14	14	n/a	14	14	14	12	n/a	13	12	12
valve travel (in.)	9	8½	n/a	7	na	9	9	n/a	7	7¾	7½
driver diameter (in.)	79	74	74	75	79	78	80	73	84	84	84
Boiler:											
pressure (PSI)	225	225	220	275	225	250	275	240	300	300	300
grate area (sq. ft.)	81.5	66.7	88	80.8	80	87.9	73.7	62.6	98.5	90.7	96.5
fuel	soft coal	soft coal	soft coal	soft coal	soft coal	soft coal	soft coal	soft coal	oil	soft coal	soft coal
cmbstn. chmbr. (in.)	none	none	none	27⅛	30	n/a	30	none	none	31	44½
tube length (ft.-in.)	20-6	20-0	20-11	18-3	19-0	19-0	19-1	20-0	21-0	19-0	19-0
syphons	none	2	none	none	3	none	2	2	2	2	3
Heating surfaces:											
evaporative (sq. ft.)	4,491	4,219	4,108	3, 861	4,205	4,247	3,377	3,826	4,770	3,979	4,166
superheater (sq. ft.)	1,965E	1,055A	980A	1,640E	1,815E	1,830E	1,492E	1,760E	2,080E	1,884E	1,695E
Weights in working order:											
drivers (lbs.)	190,700	175,800	198,300	185,000	189,720	207,730	188,600	171,400	213,440	216,000	216,000
engine (lbs.)	358,600	318,400	343,900	350,900	375,850	391,880	356,400	312,590	412,380	412,000	415,000
tender (lbs.)	305,600	218,260	298,600	292,000	289,150	326,050	305,800	189,610	396,340	360,000	375,000
Rated tractive force	53,260B	42,000	44,900	45,250	45,820	49,400B	53,400B	53,500B	49,300	55,000	50,300
Factor of adhesion	4.5	4.18	4.41	4.08	4.14	4.3	4.35	4.15	4.33	3.93	4.29
Tender capacity:											
fuel	24 tons	20 tons	20 tons	21 tons	20 tons	24 tons	20 tons	14 tons	7,000 gals	25 tons	25 tons
water (U.S. gal.)	14,000	12,000	15,000	14,400	15,000	15,000	16,800	10,000	20,000	22,000	20,000

E or A = type E or A superheater; B = tractive force including booster; Wals. = Walschaerts

New York Central needed a more powerful locomotive that could handle these important assignments unassisted.

NYC 5200 AND COUSINS

The last half of the decade of the 1920's was a busy time for the locomotive industry. In 1925, Lima Locomotive Works introduced its new 2-8-4—the first "Super-Power" locomotive. Moreover, in 1926, Alco was busy with another new Super-Power design, a 4-8-4 for the Northern Pacific. During this period, Paul W. Kiefer was Chief Engineer of Motive Power and Rolling Stock for the New York Central System, and he had already begun to consider a new locomotive to replace his overworked Pacifics. Because of NYC's close relationships with both Alco and Lima, he was able to draw upon the experience of each builder. Alco was the railroad's primary locomotive supplier, and NYC subsidiary Boston & Albany had hosted the trials of Lima's new 2-8-4.

In early 1926, Kiefer received the official go-ahead to design a new passenger locomotive. He assembled a team of people who, in collaboration with Alco, Franklin Railway Supply, and others, put together the specifications. Among the many design criteria established, two stood out in importance: 1) the locomotive must have a greater starting tractive effort and more horsepower capacity than NYC's Pacifics, and 2) the boiler must be capable of sustaining the cylinder requirements for steam for maximum developed power. To meet these requirements, a new wheel arrangement was envisioned. The design team felt a booster-equipped 4-6-4 would do the job. Use of a four-wheel trailing truck would permit a larger grate, firebox, and boiler; the trailing-truck booster would give the engine a starting tractive effort comparable to that of a 2-8-2. This 4-6-4 was destined to become one of the new Super-Power steam designs.

The large 81.5-square-foot grate was the most important feature of the new engine. It would permit the combustion of coal at a lower firing rate than was possible in one of the Pacifics. Burning coal slowly enables the boiler to absorb more of the heat released. This has two advantages. At low firing rates, the 4-6-4 could perform the same work as the Pacific while using less coal and water. However, at high firing rates, the new 4-6-4 could outperform the Pacific by developing significantly more horsepower.

Two additional key features were a feedwater heater and the Type E superheater. The NYC was advanced technically and

LATE [illegible]'s				REBUILDS				LAST
NH	DL&W	NYC	NdeM	IC	SLSF	WAB	C&O	C&O
I-5	M-1	J-3	NR-1	--	--	P-1	L-1	L-2a
1400-09	1151-55	5405-54	2700-09	1	1062-69	700-706	490-494	310-314
Baldwin	Alco	Alco	Alco	IC	SLSF	Wabash	C&O	Baldwin
1937	1938	1937/38	1938	1937	1937	1943	1946	1948
22x30	26x30	22½x29	22½x28	28x30	26x28	26x28	27x28	25x30
Wals.	Wals.	Baker	Wals.	Wals.	Wals.	Wals.	poppet	poppet
11	12	14	n/a	14	13	12	---	---
7½	7½	8½	n/a	8 3/8	7½	8	---	---
80	80	79	73	73½	74	80	74	78
285	245	275	250	265	225	220	210	255
77.1	81.5	82	66.8	100	82.5	70.9	80.7	90
soft coal	soft coal	soft coal	oil	soft coal	oil	soft coal	soft coal	soft coal
42	55	43	n/a	none	none	40	none	42
18-0	17-6	19-0	n/a	20	20-11	19-0	20-6	18-0
3	3	none	n/a	2	1	none	none	2
3,815	3,854	4,187	3,295	5,164	3,976	4,225	4,133	4,233
1,042A	1,123A	1,745E	1,100A	2111E	1,235A	1,051A	2,001E	1,810E
193,000	198,000	196,000	154,000	200,000	189,400	196,390	202,900	219,500
365,000	377,000	360,000	292,000	407,050	360,960	374,690	388,700	443,000
332,000	313,100	314,000	n/a	286,000	242,000	n/a	355,300	396,000
44,000	52,800	55,540B	41,300	68,360	55,400B	44,200	61,200B	66,200B
4.39	3.75	4.39	3.72	2.93	3.96	4.44	4.12	4.22
16 tons	26 tons	30 tons	4,037 gals	20 tons	4,500 gals	16 tons	28 tons	30 tons
18,000	15,800	14,000	9,500	15,000	13,300	12,000	18,000	21,000

J. BUCKLEY PHOTO; DAN POPE COLLECTION

On the last day of 1955, Nickel Plate Road L-1a 172 brings train 7, the *Westerner* from Buffalo and Hoboken, N.J., into Chicago. Elephant ears and pilot-deck-mounted air pumps were latter-day features of NKP's small fleet of welterweight Hudsons.

PRESTON GEORGE

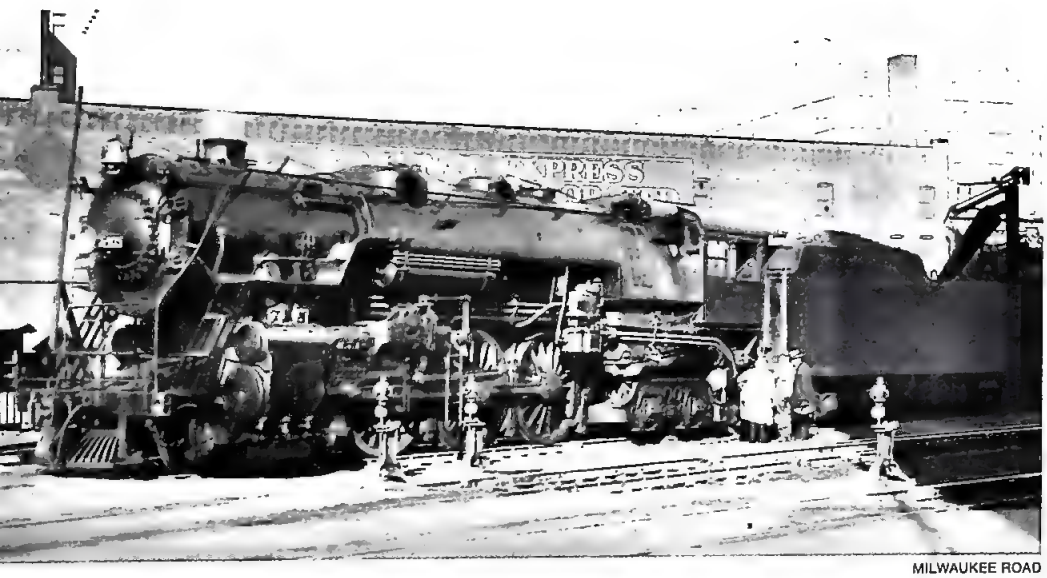
Santa Fe 3452 hurries south with the *Ranger* near Ponca City, Okla., in late 1945. As rebuilt, the 3450's were similar to NYC's J-1.

JIM SHAUGHNESSY

CP H1b 2816 works a Montreal commuter train on July 3, 1959. Today she's the only active Hudson, doing p.r. duties for CP.

TOM MILLER

Near Puce, Ont., black-and-green K-5a 5700 gallops east toward London with Canadian National train 12 on November 27, 1958.



MILWAUKEE ROAD

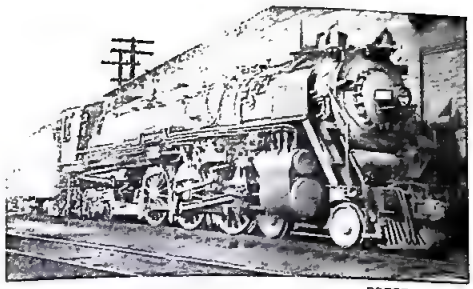
Designed in 1925 (and called a "Baltic" at the time) but not built for 5 years, brand-new Milwaukee F6 6405 takes water at the road's station in Milwaukee, on November 4, 1930.

was already familiar with these accessories. The company had been using feedwater heaters for a number of years, and several classes of its engines—including many Pacifics—were so equipped. Additionally, NYC had begun using the Type E superheater on its 4-8-2's the prior year. The Type E superheater was a two-pass design that used more, but smaller, flues, than the older Type A. Its benefits were that, compared to the Type A, designers could increase both the evaporative and superheating surface in a given boiler, and it produced steam with higher superheat temperatures. This resulted in a more powerful boiler.

Central placed an order with Alco for one locomotive, and on February 14, 1927, NYC 5200, class J-1a, saw daylight for the first time at the Schenectady Works. It was christened a "Hudson" after the river along which the engine was expected to run. Subsequent testing showed the locomotive capable of handling a 1,696-ton train—26 cars—at 75 mph. The J-1 could develop 3,100 drawbar horsepower vs. 2,500 dbhp for the K-5 Pacific. Further, the J-1 reached its horsepower peak at 57 mph, while the K-5 peaked at 45 mph. This 12-mph spread gives us a good idea of the ability of the Hudson's boiler to supply steam at speed. At 70 mph, the J-1 could develop about 900 dbhp more that the K-5. The new 5200 could move heavy trains *fast*!

As NYC's design effort was taking place in New York, another railroad, headquartered in Cleveland, was also about to go shopping for new passenger power. Walter Ross had just taken over the reins of the Nickel Plate Road, and he was a more passenger-oriented executive than his predecessor. In a surprising move, the company ordered four 4-6-4's from Alco on January 28, 1927—just four weeks after Ross became president. Little is known about this purchase decision, or of the locomotive's design effort, but it evidently was the work of NKP's mechanical department.

With unbelievable speed, just five weeks later NKP Nos. 170–173, class L-1a, left Alco's Brooks Works in Dunkirk, N.Y. The Nickel Plate engines were smaller and less sophisticated than NYC 5200. On another railroad, they would have been heavy Pacifics. NKP wanted an engine that was useable over its entire Chicago–Buffalo main line; east of Cleveland, there were several high bridges over streams feeding Lake Erie. With their light axle loadings, these structures dictated that the weight of the new engines be spread over seven axles, not six. The NKP Hudsons' grate area was just 66.7 square feet, and they had the older Type A superheater. While one could argue that they were not true Super-Power locomotives, they did the job. Satisfied, the railroad ordered four more in 1929 from



PETER ASCHER

Among North American 4-6-4's, only NdeM's were lighter than Maine Central's; MEC 702 rests at Waterville in 1946.

JOSEPH SCHICK

ROBERT MILNER

Burlington 4000, given stainless-steel cowling to pinch hit for *Zephyr* diesels, is doing just that (top) with the *Denver Zephyr* near Keenesburg, Colo., on February 25, 1938. Sixteen years later (above), shorn of her streamlining, she's on a freight at Galesburg, Ill.

Lima. These NKP engines were among the longest-lived 4-6-4's in the U.S., handling extra passenger and work trains until the end of NKP mainline steam in 1958.

With its four engines, Nickel Plate in March 1927 suddenly had the largest 4-6-4 fleet in North America, but that would not last long, as Santa Fe began taking delivery of 10 new Hudsons from Baldwin in May. These 3450-class locomotives were a Santa Fe design, and as was typical of the road's cautious approach to Super-Power, they were rather conservative when compared to NYC 5200. They essentially had the boiler barrel of a 3400-class 4-6-2 mated to a large firebox that required a four-wheel trailing truck. Most other key specs followed those of a 3400. All were coal-fired.

In service, the operating department loved them, but the passenger department had its misgivings. The 3450's replaced oil-fired Pacifics on the top trains between Kansas City and La Junta, Colo., and while they easily outperformed the Pacifics, the trail of cinders from their stacks led to many complaints by passengers in this pre-air-conditioned era. Eventually, Santa Fe converted all to oil-firing.

During the late 1930's, the 10 Hudsons were updated. They received 79-inch Boxpok driving wheels, 10 psi more boiler pressure, firebox siphons, and a small combustion chamber created by shortening the boiler tubes. The 3450's migrated around the system; five went to California's Central Valley, where they hauled the hotly competitive Bay Area–Los Angeles trains between Oakland and Bakersfield. Nevertheless, they were easy prey for diesels, and all were gone by 1955.

Meanwhile, NYC had been busy conducting a series of trials with the 5200. After evaluation of the results, the road placed orders for more Hudsons, with deliveries beginning in September 1927. Central eventually acquired 205 J-1 locomotives in five sub-classes. The chief difference between No. 5200 and the follow-on engines was use of an integrally cast steel frame and cylinders. The later engines also came equipped with larger, six-axle tenders. For its hilly Boston & Albany subsidiary, NYC bought 20 4-6-4's equipped with 76-inch drivers, class J-2. By 1931, the company owned 225 Hudsons. As the primary power for Central's long-haul trains, the 4-6-4's played an important role in promoting the public-relations-conscious railroad's high-profile passenger service.

CPR RAISES THE BAR

Two important innovations came to the 4-6-4 in November 1929 when Canadian Pacific took delivery of the first of 10, class H1a, from Montreal Locomotive Works. The prior year, Henry Blaine Bowen had become CP's Chief of Motive Power and Rolling Stock. In December 1928, under his direction, the Drawing Office produced designs for two new engines that used the same boiler: a 4-6-4 and a 2-8-4. Only the 4-6-4's were built. They were remarkable in having high-pressure boilers and firebox combustion chambers—two Hudson firsts.

Room for the combustion chamber was made by shortening the tubes a bit. A combustion chamber increases the firebox furnace volume, thereby giving fuel a better chance to completely burn before passing through the tubes. Creating a combustion chamber by shortening the tubes is usually a good trade-off. The combustion chamber heating surface—being part of the firebox—absorbs heat at a rate that is much greater than that of the tubes. The heat absorbed by this additional "firebox" heating surface more than makes up for that lost by shortening the tubes. The combination of the combustion chamber and the high boiler pressure created a more powerful locomotive. Most new 4-6-4's would incorporate these improvements.

CP's engines entered service between Montreal and Smiths Falls, Ont., and then their runs were extended to Toronto. Ten

E. C. KLEWER

JOHN D. WEIDENFELLER

E. T. HARLEY

High-wheelers: Santa Fe 3460 (top), sole member of its class to be streamlined, heels to a curve with the *Oil Flyer* at Dewey, Okla., in May 1951. C&NW's E-4's (middle, with an eastbound east of Glen Ellyn, Ill., in the late '40's) and Milwaukee's F7's (above, banging through Mayfair in Chicago in May 1941 with the *Afternoon Hi*) were similar in design.

more arrived in 1930, extending the Hudsons' range as far west as Calgary, Alta. Bowen was keen to copy the operation of NYC's Hudsons by lengthening engine runs, and CP H1's soon began handling the *Dominion* and other top trains for long distances without a locomotive change. The longest stretch was between Fort William, Ont., and Calgary—1,252 miles.

WRAPPING UP THE DECADE

In 1930 four more roads joined the 4-6-4 club. Baldwin delivered 14 to the Milwaukee Road, 12 to the Burlington Route, and 2 to Maine Central. In Canada, Montreal built 5 Hudsons for Canadian National.

The Milwaukee had designed its 4-6-4's back in 1925 and planned to call them Baltics. The idea was shelved when the road filed for bankruptcy the same year, but after a 1929 corporate reorganization, the company's board authorized the purchase of 14 Hudsons, class F6. They went to work between Chicago and Minneapolis on top trains like the *Pioneer Limited* and *Olympian*. These were big trains, but not particularly fast—the Milwaukee's big speed-up was still in the future. The F6's performed well and were joined by 8 more in 1931. At this point, all the road's key trains between Chicago and Milwaukee and Chicago and Omaha were handled by Hudsons.

Burlington's 4-6-4's were the heaviest to date when delivered. They entered service between Chicago and the Twin Cities and Chicago and Denver. These class S-4's replaced 4-6-2's and 4-8-2's on these routes and immediately demonstrated their ability to run through without engine changes. They operated from Chicago to Minneapolis with just one coal stop and two water stops. On the Denver route, they ran without change between Chicago and Lincoln, Nebr., 551 miles. As on the Milwaukee, CB&Q's trains in the pre-*Zephyr* era were not especially fast. The company's West Burlington (Iowa) shops constructed two additional 4-6-4's in 1935 and '38 using Baldwin-supplied boilers.

In the late 1930's, two of the Q's Hudsons achieved fame as stand-ins for the diesels on the new *Zephyrs*. They were streamlined, and each was named *Aelous*, or "Keeper of the Winds." In 1938, one was clocked at 112 mph on the Twin Cities route. The S-4's had long and fruitful careers, operating until CB&Q's end of steam in the 1950's. Indeed, the last Hudson-hauled steam-era passenger train in the U.S. was an excursion handled by an S-4 in October 1958.

Although the two Canadian transcontinental railways operated through the same territory, CP and CN saw things differently from the standpoint of motive power. CP employed six-coupled passenger power and put Mikados at the head of freights, while CN chose dual-purpose 4-8-2's and 4-8-4's

passenger and freight service. The exceptions to this were the five Hudsons CN received from Montreal in 1930 for Montreal–Toronto express passenger runs. Technically, they were quite sophisticated, and they had a pleasing appearance, with a semi-streamlined look highlighted by CN's deep green paint. Over the years, their territory shifted to the Toronto–Windsor corridor, where they ran into 1959.

Also in 1930, little Maine Central bought two Baldwin 4-6-4's for Bangor–Boston passenger service, a joint MEC-Boston & Maine operation. They were the second-smallest Hudsons in North America and would have been 4-6-2's anywhere else. The pair had smallish eight-wheel tenders that allowed them to use MEC's 75-foot turntables. In service, they did a credible job handling name trains such as the *Flying Yankee* and the *Bar Harbor Express*.

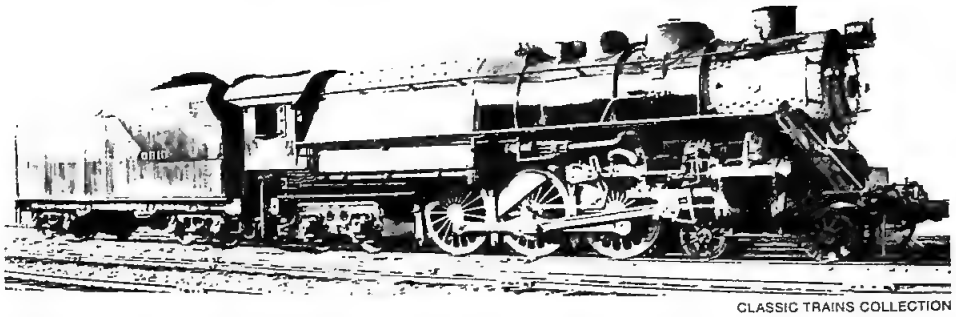
THE HIGH-WHEELERS

Early in the Great Depression, the railroads sidelined thousands of engines, and new locomotive orders pretty much came to a standstill. However, by the middle of the decade, signs of recovery were on the horizon and several roads began to experiment with lightweight streamliners and diesels. Some even ordered new high-speed steam power. In 1937–38, Baldwin delivered six Hudsons to the Santa Fe, while Alco built nine for Chicago & North Western and six more for Milwaukee Road. The three designs all had 300 psi boilers and 84-inch drivers—the highest wheels ever on a North American 4-6-4. Further, they were the biggest Hudsons built to date.

The Santa Fe engines were specifically designed as oil-burners, the only Hudsons in this category. They came with a mammoth firebox equipped with two siphons and a 98.5-square-foot grate, but no combustion chamber. Santa Fe rated them at a timetable maximum of 100 mph. One, class leader 3460, dubbed "Blue Goose" in reference to its blue livery, was the road's only streamlined steam engine. While not typically assigned to top trains such as the *Chief*, the new Hudsons spent plenty of time on the *Grand Canyon Limited*, *California Limited*, and other mainline trains.

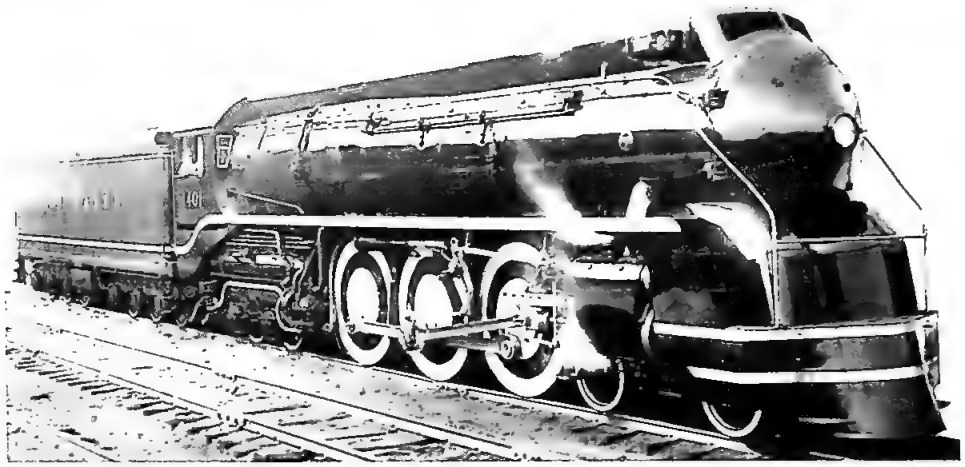
The North Western placed its nine class E-4 Hudsons—streamlined in a handsome dark green jacket accented by yellow pinstripes—in service between Chicago and Omaha. C&NW's speed limit was just 80 mph, so, unlike the new Santa Fe and Milwaukee Hudsons, the E-4's were not known for burning up the right of way at "100 per." There was one spectacular exception, however. During Association of American Railroads–sponsored field trials in the late 1930's, C&NW 4002 reached a top speed of 95 mph with a 1,000-ton train.

Upon delivery, Milwaukee Road's new streamlined Hudsons, class F7, were assigned to the premium *Hiawatha* service between Chicago and Minneapolis [pages 14–25]. *Hiawatha* schedules were shortened, and 110-mph running became commonplace. But despite magnificent performances such as this, these handsome engines enjoyed relatively short lives. As diesels began arriving after World War II, the F7's were downgraded to secondary trains, and then a fatal blow came: The engines' silicon steel boilers began cracking. Dieselization was in full swing, so, instead of investing in new boilers, Milwaukee Road simply retired the F7's; all were gone by 1951.



CLASSIC TRAINS COLLECTION

B&O's four Hudsons all had big water-tube fireboxes. No. 5047, converted from a Pacific, was first, followed by two similar sisters and the British-styled *Lord Baltimore*, all built new.



BALDWIN PHOTO; H. L. BROADBELT COLLECTION

With their "whitewall" drivers and chrome trim, New Haven's I-5 Shoreliners were truly striking machines. Alas, high-speed slipping and Alco diesels shortened their lives.

ROUNDING OUT SOME ROSTERS

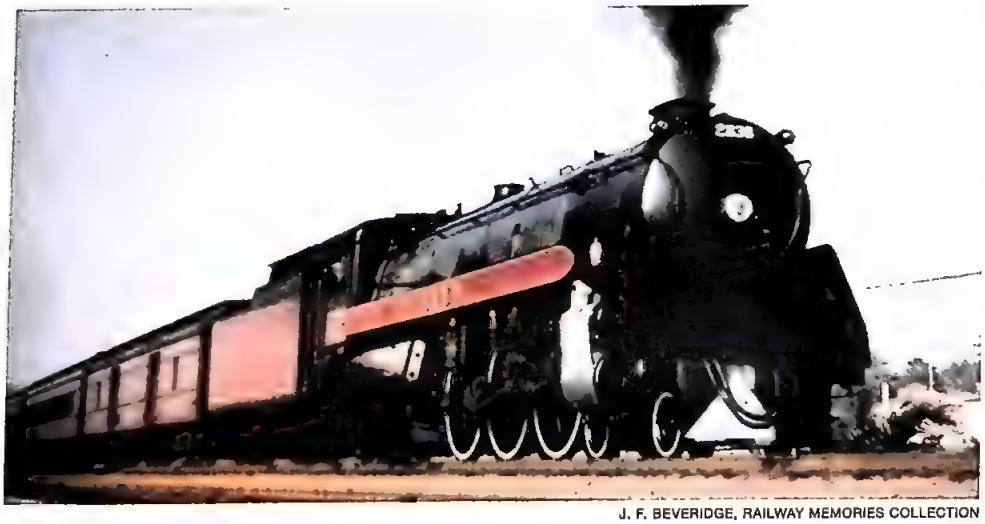
Other railroads acquired Hudsons in the mid-1930's. The first was Baltimore & Ohio, whose Mount Clare (Baltimore) shops converted P-1c Pacific 5047 to a Hudson (class V-1, same number) in 1933. The rebuilding included a large water-tube firebox, necessitating a four-wheel trailing truck. The engine broke ground for three built-new, water-tube-fireboxed 4-6-4's of 1935–36, one of which, No. 2 *Lord Baltimore*, had 84-inch drivers. The last of the four Hudsons left B&O's roster in 1950.

The year 1937 saw the introduction of three new Hudson designs. The first were 10 streamlined 4-6-4's delivered to the New Haven by Baldwin. Dubbed Shoreliners, the class I-5's went into service between New Haven and Boston on NH's finest trains. While the locomotives were an economic success, they gained considerable notoriety because of their high-speed wheel slips. It was determined that if the drivers slipped at speeds above 81 mph, there was sufficient dynamic augment to lift the driving wheels from the rails. The resulting hammer-like blows when the wheels came back down kinked the rails. The problem was never completely solved, and the locomotives were restricted to 70 mph. The Shoreliners were also early casualties of the diesel, being retired by 1951.

The Lackawanna followed the common motive-power philosophy of the time by assigning the right-sized locomotive to each job. Big 4-8-4's took DL&W's passenger trains from New York to Scranton, Pa., through the Pocono Mountains, while Pacifics forwarded them west over the easier territory to Buffalo. As the economy picked

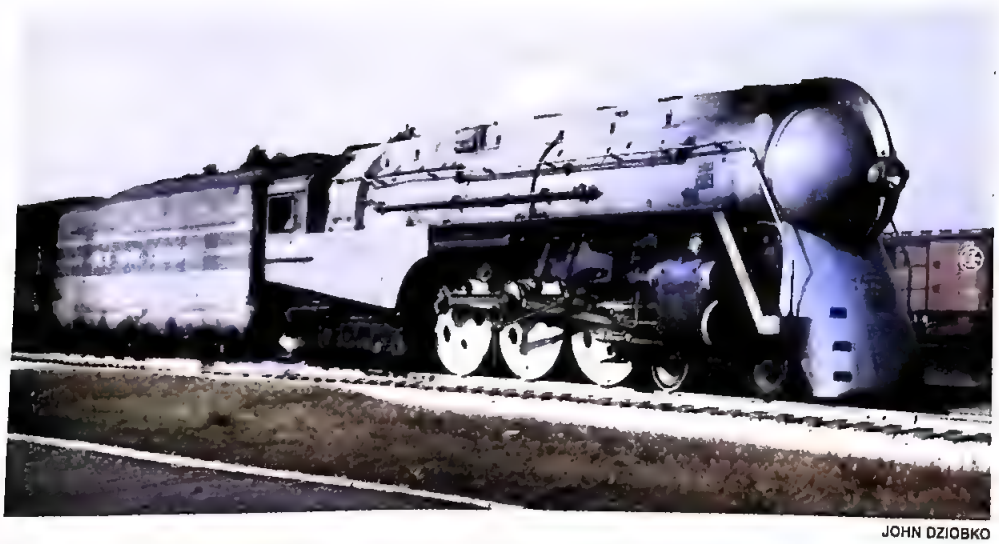
W. R. OSBORNE

Lackawanna's handful of Hudsons were built to haul heavy limiteds between Scranton and Buffalo; No. 1153 demonstrates her suitability for this service in this undated view.



J. F. BEVERIDGE, RAILWAY MEMORIES COLLECTION

Though mechanically similar to CP's 20 standard 4-6-4's, its 45 Royal Hudsons had a cachet that endures to this day; well-kept 2838 works train 712 at Oakville, Ont., in 1957.



JOHN DZIOBKO

Streamlined NYC J-3a 5450—a member of perhaps the best-known group of locomotives in America—pauses at Englewood, Ill., with an eastbound train in the early 1950's.

up, longer trains—now equipped with air-conditioning—were taxing the ability of the 4-6-2's, and rather than operate 4-8-4's through to Buffalo, DL&W designed a new 4-6-4 and ordered five from Alco. The road introduced them to the public with great fanfare, claiming they were capable of handling 12-car trains at 100 mph. While this might have been true, Lackawanna's passenger speed limit was just 70 mph. With the arrival of diesels after the war, the 4-6-4's were downgraded to secondary and commuter trains, and were retired by 1952.

SUPER AND ROYAL

At the onset of the Depression, after a few years' experience with the J-1, Hudson pioneer New York Central designed and then shelved plans for a more powerful 4-6-4. As the economy improved, however, the road dusted off this design and ordered from Alco 50 new class J-3 "Super Hudsons" for delivery in 1937–38. They were slightly larger than a J-1, and 10 of them arrived with streamlined shrouds right from the factory. However, most of the significant changes were "under the hood." The boiler pressure was raised 50 psi to 275, and they were equipped with combustion chambers. All came with roller bearings on all axles. Another, more subtle change was in the valve gear. The J-1's had 9 inches of valve travel powered by Walschaerts valve gear. While the long travel gave them excellent valve events, the Walschaerts gear could not comfortably provide this much travel. Later J-1's came with Baker valve gear, and most of the earlier engines were later rebuilt with it. The new J-3 had Baker gear and 8½-inch travel.

The J-3 began setting records. The streamlined engines assigned to the new, lightweight *20th Century Limited* began running through from Harmon, N.Y., to Chicago, 928 miles. This was an overnight run with water taken on the fly from track pans and just one stop for coaling and fire-cleaning. In this service, J-3's began averaging more than 17,000 miles a month. And they could *move*: Fresh from Alco, J-3 5408 reached 98.9 mph on a slight downgrade with a 1,000-ton AAR test train.

After the war, the combination of diesels and a reduction in passenger-train miles took its toll on the Central's great fleet of Hudsons. The last important train regularly handled by 4-6-4's was the Cincinnati–Chicago streamliner *James Whitcomb Riley*; it got diesels in January 1956, and by May, all 4-6-4's had been stricken from the roster.

Canadian Pacific also went shopping for more Hudsons in the late 1930's. The H1 design of 1928 was the basis for the new engines, but their external appearance was strikingly different. They wore beautiful steel-gray boiler jackets accented by black and maroon highlights along with gold

let[illegible] In all, 45 engines in subclasses H1c, d and e were built between 1937 and 1940. The last five came as oil-burners for service in British Columbia. The class's defining moment occurred during the visit of King George VI and Queen Elizabeth in 1939. For duty on the Royal Train, Hudson 2850 was embellished with a small crown on each running-board skirt. Later, with the monarchs' permission, all CP streamlined 4-6-4's would wear similar crowns; consequently, they became known as Royal Hudsons.

The CP Hudsons were among the longest-lived in North America, with examples of both the standard and Royal variety operating into spring 1960 ["In Service to the Royals," Winter 2008 CLASSIC TRAINS].

Again in 1937, Alco built 10 light 4-6-4's for National of Mexico. Weight considerations dictated that they be Hudsons instead of Pacifics. They lived long lives, not being retired until the end of 1963—the last of any North American 4-6-4's.

THE REBUILDS

With a rebuild, a key component—such as the boiler—is taken from a surplus locomotive and mounted on a new frame and running gear. The goal is a new locomotive that is better suited to the railroad's needs. Sometimes great things result; when they do not, it is often because something inherent in the design of the old locomotive limits its performance. It might be too small a grate area, a low boiler pressure, or an obsolete superheater.

Five railroads rebuilt existing engines into Hudsons. In 1937, four years after B&O's conversion of a Pacific into a water-tube-firebox Hudson, Illinois Central took the high-capacity boiler from one of its Lima-built 2-8-4's and mounted it on a new 4-6-4 frame. The road was hoping to create a fleet of fast-freight Hudsons, but it was not to be. Train sizes quickly outgrew the capability of the engine, which was notoriously slippery, and IC's 4-8-2's proved to have the power and speed desired. IC No. 1, the loneliest Hudson of all, ended up on secondary passenger trains on the Kentucky Division and was removed from service in 1949 when it needed a major shopping. One can only wonder what might have been if IC had intended this as a passenger engine and the remainder of its 51 Berkshires had been rebuilt. They might have made dandy replacements for the road's fleet of spindly Pacifics, but instead, IC began acquiring E-unit diesels in 1940.

Both the Frisco and the Wabash owned rebuilt Hudsons. Starting in 1937, Frisco began taking the boilers from 10 Pacifics, applying new fireboxes, and mounting them on 4-6-4 running gear. Wabash did likewise in 1943 by reusing the boilers from seven 2-8-2's. The Frisco engines were oil-burners, while Wabash's burned coal and wore blue and gray semi-streamlining. Comparing the boilers on the rebuilds, the Frisco's had large grates, but no combustion chambers, while Wabash's had small grates, but with combustion chambers. Both retained their outmoded Type A superheaters. In service, these rebuilds did the job as intended. On the Frisco they freed up 4-8-2's on the Kansas City–Birmingham run, and on the Wabash they supplemented 4-6-2's on mainline trains, mainly between St. Louis and Chicago. Nevertheless, both Frisco and Wabash dieselized early, and their Hudsons were off the rosters by the early 1950's.

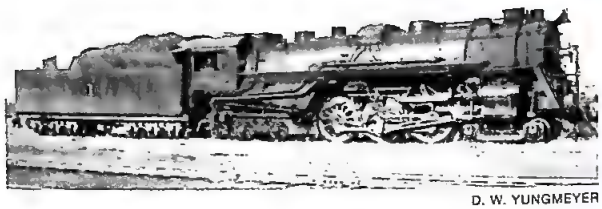
THE HUDSON CLAN, 487 STRONG

Railroad	Class	Road Nos.	Quantity	Builder	Year	Notes
ATSF	3450	3450-3459	10	Baldwin	1927	
	3460	3460-3465	6	Baldwin	1937	1
B&O	V-1	5047	1	B&O	1933	
	V-2	2	1	B&O	1935	2, 3
	V-3	5350	1	B&O	1935	
	V-4	5360	1	B&O	1936	
B&A (NYC)	J-2a, b	600-619	20	Alco, Lima	1928–31	
CN	K-5a	5700-5704	5	Montreal	1930	3
CPR	H1a, b	2800-2819	20	Montreal	1929	
	H1c, d, e	2820-2865	45	Montreal	1937-40	3
C&O	L-2	300-307	8	Baldwin	1941-42	
	L-1	490-494	5	C&O	1946-47	4
	L-2a	310-314	5	Baldwin	1948	
C&NW	E-4	4001-4009	10	Alco	1938	5
CB&Q	S-4	3000-3011	12	Baldwin	1930	6
	S-4	3012	1	CB&Q	1935	
	S-4A	4001	1	CB&Q	1938	5
MILW	F6	6400-6413	14	Baldwin	1930	
	F6a	6414-6421	8	Baldwin	1931	
	F7	100-105	6	Alco	1937	5
DL&W	M-1	1151-1155	5	Alco	1938	
IC	-	1	1	IC	1937	7
MEC	D	701-702	2	Baldwin	1930	
NdeM	NR-1	2700-2709	10	Alco	1937	
NH	I-5	1400-1409	10	Baldwin	1937	5
NKP	L-1a	170-173	4	Alco	1927	
	L-1b	174-177	4	Lima	1929	
NYC (excl. B&A)	J-1a–J-1e	5200-5404	205	Alco	1927-31	8, 9
	J-3a	5405-5454	50	Alco	1937-38	10
SLSF	-	1062-1069	8	SLSF	1937	3
WAB	P-1	700-706	7	WAB	1943	3

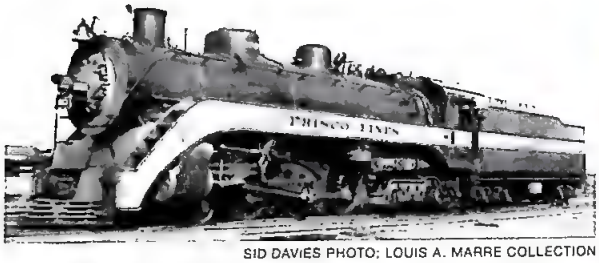
NOTES: 1) 3460 built streamlined. 2) Named *Lord Baltimore*, to 5340. 3) Built semi-streamlined. 4) 490–493 built streamlined. 5) Built streamlined. 6) 3002 upgraded to S-4A 4000 and streamlined, 1937; 3008, 3009, and 3011 upgraded to S-4A's 4002, 4003, and 4004 in 1938. 7) To 2499. 8) 5344 streamlined, named *Commodore Vanderbilt*, 1934. 9) 5311 to Toronto, Hamilton & Buffalo 501, 5313 to TH&B 502, 1948. 10) 5426 and 5429 streamlined, 1941; 5445–5454 built streamlined.

LAST AND LARGEST

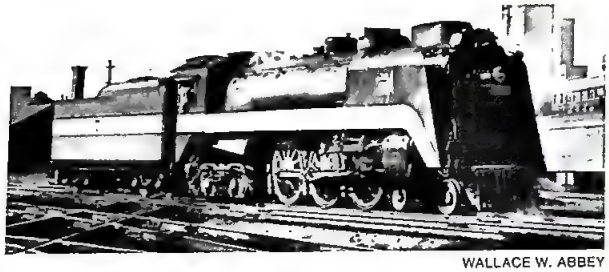
Just prior to World War II, Chesapeake & Ohio developed the ultimate Hudson. It was an in-house design created by the railroad's Advisory Mechanical Committee—the same group that had designed the Nickel Plate 2-8-4's and the C&O 2-10-4's. The starting point was the boiler from the NKP engine. The Hudson boiler had the same firebox dimensions as the 2-8-4. The barrel was 1 foot shorter and the courses 2 inches less in diameter. Mounted on a 4-6-4 frame, these eight engines, class L-2, weighed in at 439,500 lbs.—the biggest Hudsons built to date. In service, they handled the railroad's top trains such as the



D. W. YUNGMEYER



SID DAVIES PHOTO; LOUIS A. MARRE COLLECTION



WALLACE W. ABBEY

ROBERT MILNER

Rebuilds: IC No. 1 (top left), had a 2-8-4's boiler and was intended for freight service. Frisco 1063 (middle left) came from a 4-6-2, while Wabash 700 started life as a 2-8-2. Eye-catching C&O 490 was converted from a standard Pacific, and survives at the B&O museum.

George Washington and the *F.F.V.* between Hinton, W.Va., and Cincinnati.

After the war, C&O Chairman Robert R. Young had grand plans for the company's passenger service, and C&O placed big orders for new cars with Pullman-Standard and Budd. Additional locomotives were needed too, and on the coal-hauling C&O, this meant steam. However, instead of buying new, the road rebuilt five F-19 Pacifics into Hudsons, making C&O the fifth railroad to rebuild older power into 4-6-4's. In 1946, C&O's Huntington Shops took the Pacific boilers and added new fireboxes, new smokeboxes, and Type E superheaters. In addition, the engines had roller bearings on all axles, and side rods and were equipped with Franklin poppet valves. Four of the five came streamlined out of the shop. The resultant 4-6-4's, class L-1, were capable machines that were used interchangeably with the earlier L-2's.

BOB BORCHERDING

The C&O L-2a was the last, and heaviest, word in Hudsons; 1948-built No. 313 simmers at the Cincinnati Union Terminal enginehouse in March 1952, her brief career nearly over.

With postwar traffic remaining at high levels, C&O found it necessary to order still more passenger power. Five more Hudsons, class L-2a, were received from Baldwin in 1948. They were the same design as the earlier L-2's except that, like the L-1's, they had Franklin poppet valve gear and roller bearings on all axles and side rods. They weighed an additional 3,500 lbs. and so were the heaviest, and last, 4-6-4's built in North America. They weighed 100,000 lbs. more than NYC 5200, the very first Hudson of 1927. The C&O Hudsons had extremely short lives, however; in 1951, when the road began acquiring EMD E8 diesels, the end came quickly.

The combination of the diesel and the sharp decline in passenger service after World War II dealt the Hudson a double whammy. On most railroads, they were gone before the middle 1950's. One of the unfortunate aspects of this is that relatively few 4-6-4's survived. Only 17 remain, from seven railroads: Santa Fe, 2; CN, 2; CP, 5; C&O, 1; CB&Q, 5; NdeM, 1; and NKP, 1. Missing from the list is New York Central. This one railroad, which built the first, and by far owned the most, didn't save a single example of its signature locomotive. We are poorer as a result. All we have left are memories of what was once the greatest locomotive fleet on the continent. ■

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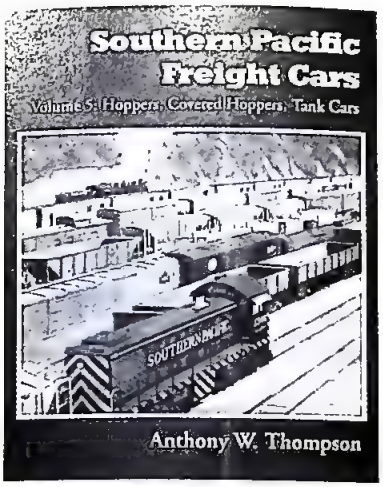

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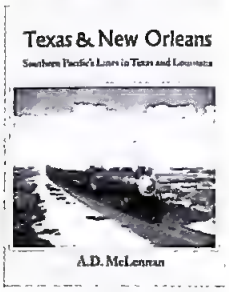

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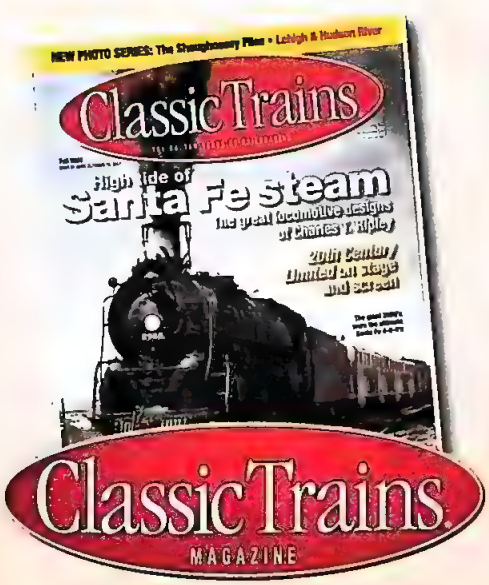

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NEIL HUFF PHOTOS; FRANK AND TODD NOVAK COLLECTION

Nickel Plate Road's cabooses were famously emblazoned with the slogan "Nickel Plate High Speed Service." The engines that made good on that promise were 80 incomparable Berkshires, one of which—class S No. 714, from NKP's first 2-8-4 order, built by Alco in 1934—is pictured coming and going at Bellevue, Ohio, in 1958.

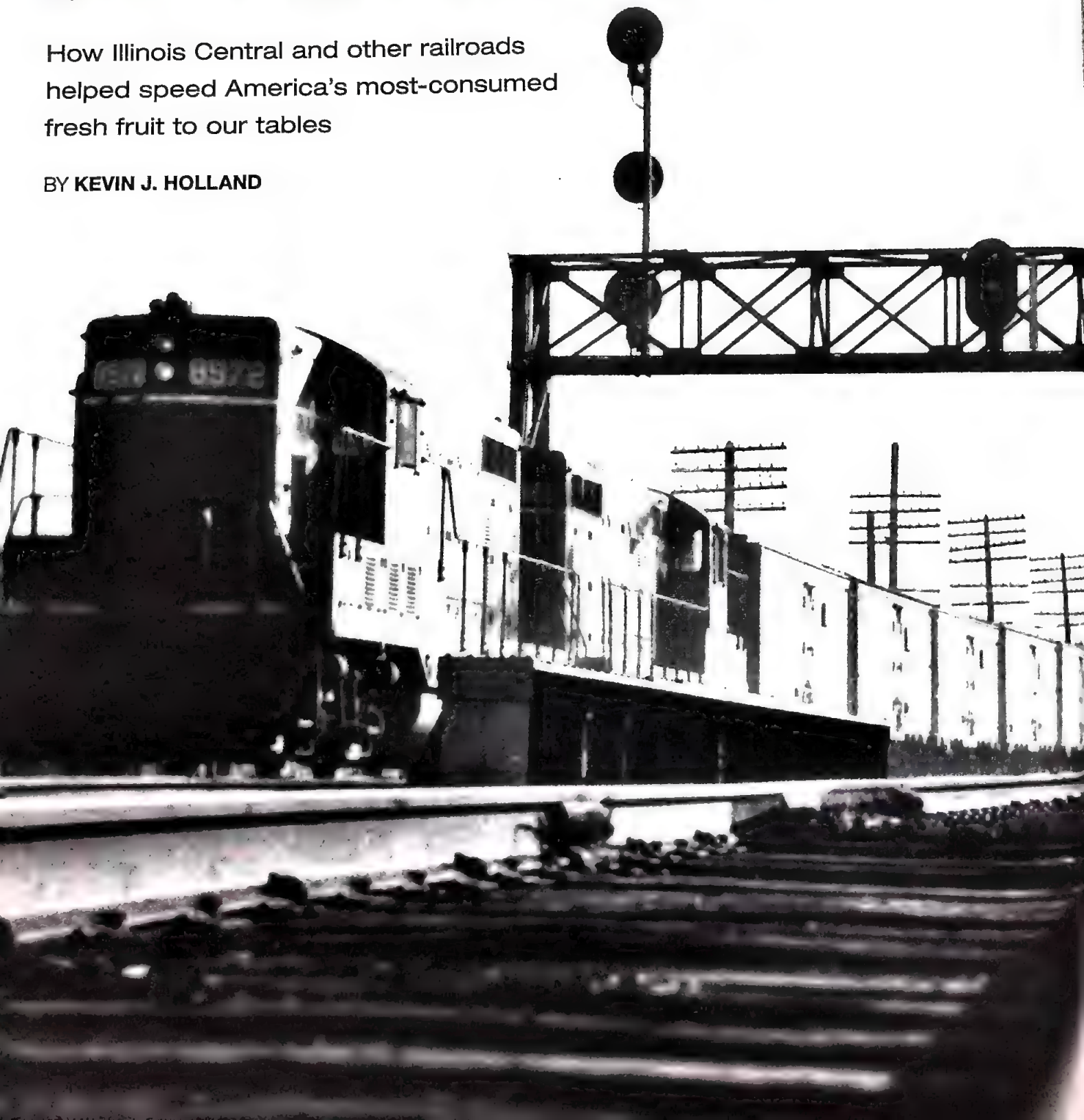
FRANK AND TODD NOVAK COLLECTION

Frisco, like NKP, promoted its merchandise service with a memorable slogan ("Frisco Faster Freight"), but its passenger trains weren't particularly fast. In the diesel age, though, Frisco varnish had a speed-related cachet, thanks to the road's practice of naming its E units after famous horses. Since ancient times, the horse has been a symbol of speed, and while not all of Frisco's 23 E units (6 E7's, 17 E8's) bore the names of racehorses, 17 of them did. Here's E7 2004 *Dan Patch*, namesake of the world-record-setting pacer of the early 1900's, and an E8 curving out of St. Louis Union Station with the *Will Rogers* for Oklahoma City in late 1962 or early '63.

Banana trains of Mid-America

How Illinois Central and other railroads helped speed America's most-consumed fresh fruit to our tables

BY **KEVIN J. HOLLAND**



Celebrated in song, with a popular image ranging from slapstick to suggestive, the banana is, in fact, serious business. It's the world's most-consumed fresh fruit; North Americans long have eaten more bananas than fresh apples and citrus combined. The improbable rise of this fragile fruit dates back 125 years, made possible by rapid, reliable railroad service linking U.S. ports with inland markets.

Bananas are temperature-sensitive, with a narrow "safe" range in transit (55° to 60° Fahrenheit) and a short shelf life afterward—barely three weeks between harvest and spoilage. Railroads serving Atlantic and Gulf Coast ports, however, showed that with speed and attentive handling, bananas could be moved from their tropical growing areas to virtually anywhere in the United States and Canada in time for consumption.

This near-universal availability was made possible by a choreographed interchange between steamships and railroads, and by technological advances in the late 1800's that brought reliable refrigeration, ventilation, and communication to both modes. A combination of speed and climate control allowed bananas to reach inland markets before spoiling; otherwise, the fruit would have remained a coastal curiosity.

The railroad most closely associated with the banana industry was Illinois Central, thanks to its routes linking the Gulf Coast with St. Louis and especially Chicago, and connections to markets throughout the populous Midwest. IC's major port, New Orleans, was closer to Latin American growing areas than East Coast ports. The Crescent City was a leading port of entry for bananas by 1900, and for several decades it handled almost one-third of U.S. traffic.

Mature but unripe and clad in green peel when harvested, commercially cultivated bananas are best eaten when ripened to a brown-flecked yellow peel. Refrigerated and ventilated cargo ships designed to carry bananas were introduced by United Fruit Co. (UFCo) in 1903, retarding the ripening process enough to permit the faster rail portion of the fruit's journey to extend far beyond port cities. The big growing companies owned fleets of fast ships to move bananas from the tropics; UFCo's "Great White Fleet" of more than 60 vessels was particularly well known.

Railroads were equally indispensable to the banana industry, at both ends of the journey. In Central America, narrow-gauge networks ferried fruit in ventilated boxcars from plantations to ships (the longest haul approached 300 miles, across Guatemala

PHOTO, BRUCE MEYER; BANANA ILLUSTRATION FROM UNITED FRUIT CO. SHIP MENU, KEVIN HOLLAND COLLECTION

Symbolic of the Illinois Central's fast New Orleans–Chicago banana trains is this one, behind a GP7-GP9 duo, rolling through the passenger station at Champaign, Ill., on December 19, 1957.

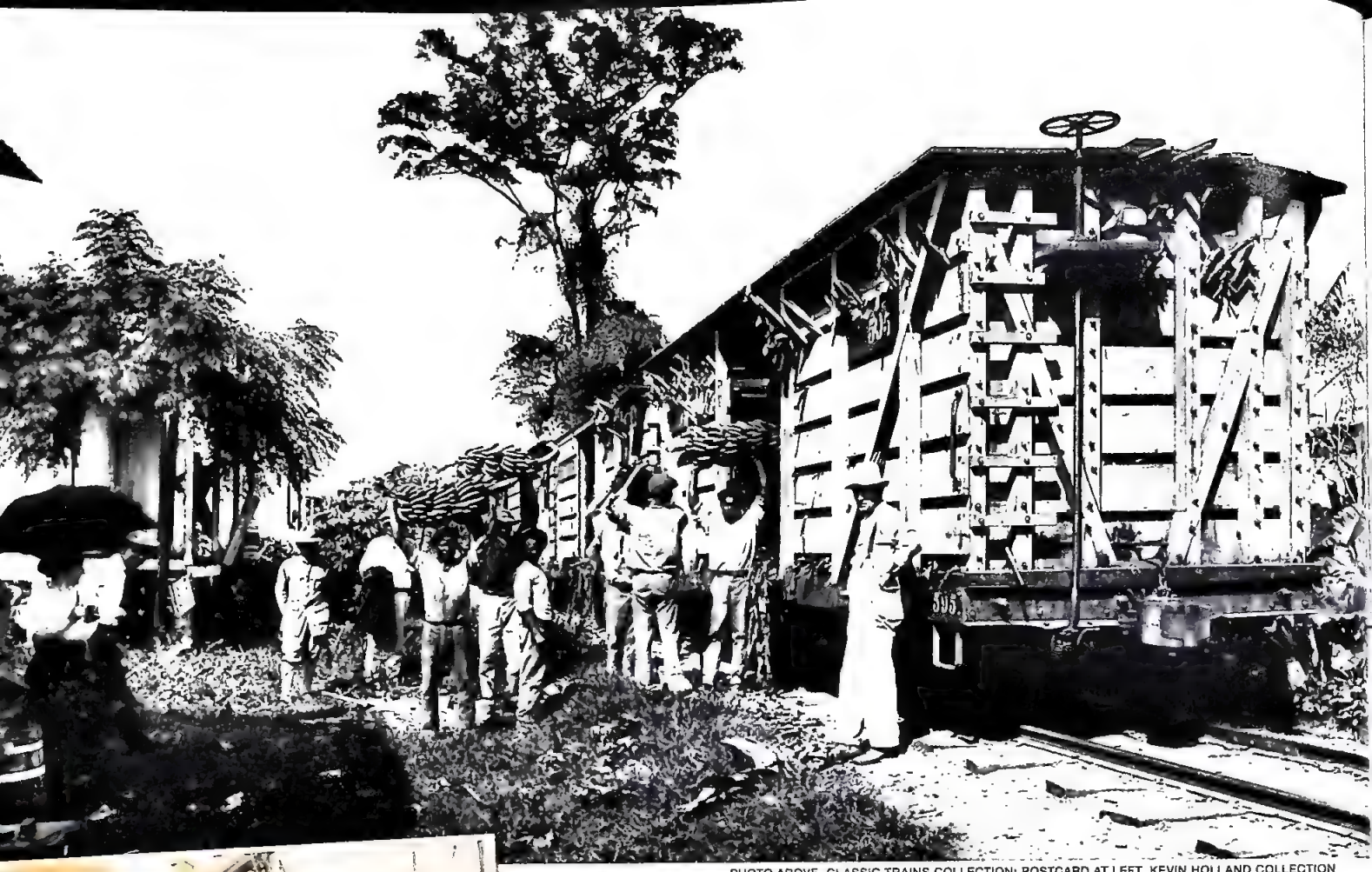


PHOTO ABOVE, CLASSIC TRAINS COLLECTION; POSTCARD AT LEFT, KEVIN HOLLAND COLLECTION

Bananas would often begin their trek to market on narrow-gauge Central American lines (above), taken to Caribbean ports, where they'd be loaded on ships in United Fruit Co.'s "Great White Fleet" (left, being unloaded at New Orleans in a 1911 colored postcard). In the U.S., their final stop before your home likely was a retail counter, exemplified by this one (below), circa 1948.

LIBRARY OF CONGRESS

from Pacific to Atlantic), while in North America, refrigerator cars maintaining the required temperature and ventilation were the key.

Almost a half-century has passed since the railroads' formative link in the North American distribution chain was broken, the indirect result of an ecological calamity. In the heyday, however, bananas moved over the railroads with enough speed and pampering to make passengers green with envy.

SOMETHING NEW

Bananas, as we know them, were introduced to North America in the early 1800's when ships reaching New Orleans, New York, and Boston from Jamaica and Cuba carried the fruit as deck cargo. Able to reap great profit selling the novel delicacy dockside, ship owners soon established a regular traffic. Sold by street peddlers in port cities, bananas even showed up in posh restaurants, but the ripened fruit's fragility following slow sea voyages made forwarding inland problematic.

Three men are credited with establishing the North American banana industry: Boston ship owner Lorenzo Baker; entrepreneur Andrew Preston; and Minor Keith, a builder of railroads in Latin America. Baker and Preston's Boston Fruit Co.,

HEDRICH BLESSING PHOTO FOR ILLINOIS CENTRAL, DON HORN COLLECTION; ANDREW PRESTON PHOTO BELOW, LIBRARY OF CONGRESS

Bananas are taken from a conveyor belt and loaded onto Illinois Central refrigerator cars at the Thalia Street wharf in New Orleans.

founded in 1885, grew to control the importation and distribution of bananas in the Northeast. Keith cultivated bananas in Latin America as a traffic source for his rail and steamship interests, and, using the ports of New Orleans and Mobile, he distributed bananas in the Deep South.

In March 1899, the three merged their banana interests to form United Fruit Co. Competitors emerged, notably the Vaccaro brothers' Standard Fruit & Steamship Co. in New Orleans and Samuel Zemurray's Cuyamel Fruit Co., but United remained the industry's dominant force, especially after acquiring Cuyamel in 1929. Known derisively as El Pulpo (the octopus), UFCo would alter the environmental and political landscape of Latin America to its commercial advantage through much of the 20th century, engendering the term "banana republic." Its far-flung, vertically integrated operation, emulated by competitors, ensured a reliable supply by controlling banana cultivation, harvest, transport, sales, and consumer marketing.

MAKING LANDFALL

By the start of the 20th century, New York was up there next to New Orleans as a banana port of entry, although smaller operations at Baltimore, Boston, and Philadelphia also helped put the fruit at Northeastern consumer doorsteps. New Orleans' pre-eminence rested on its proximity to Latin American sources of supply (about 900 nautical miles and 2½ days from Honduras or Guatemala, versus a 2,100-mile, 6-day sailing to New York), which meant better utilization of growers' ships. Railroads took over as early as possible in the journey, speeding the ripening cargo north from the Crescent City and smaller terminals at Mobile, Ala., and Galveston, Texas. Virtually all bananas destined for the western U.S. and Canada also flowed through these ports and into refrigerator cars until 1927, when a dedicated banana terminal opened in Los Angeles.

Growers in Honduras, Panama, and Ecuador had begun exporting from Pacific ports, eliminating the Panama Canal transit that discouraged Caribbean banana shipments to the U.S. West Coast. L.A.'s operation—served by the Harbor Belt Line Railroad after 1929 on behalf of Southern Pacific, Pacific Electric, Union Pacific, and Santa Fe—was mechanized and expanded in 1936 when UFCo opened a new terminal, second in size and modernity only to New Orleans'.

Through the mid-1950's, New Orleans led with nearly 30 percent of North American banana imports, followed by New York with 20 percent. Florida ports handled 12 percent, the same as L.A. and San Francisco together. The remaining bananas arrived at two dozen smaller ports, from Seattle to Saint John, New Brunswick.

Andrew Preston

Until the early 1960's, bananas were shipped from the tropics as green "stems" weighing 50 to 75 pounds or more—a single banana plant yielded one stem when it flowered. In 1898, some 16 million stems were imported into North America. After World War I shipping restrictions ended, volume soared to 65 million stems in 1929 and reached almost 68 million in

C. W. WITBECK COLLECTION

ILLINOIS CENTRAL

Banana trains' locomotives, as well as their cars [page 71], evolved. IC 2-6-0 554 posed with 34-car train No. 52 (above) in May 1903. In the 1940's (left), 4-8-2 2605 rolled north with a long train alongside U.S. 54 near Peotone, Ill., 40 miles out of Chicago.

1937. World War II brought more disruption, as UFCo and Standard Fruit ship fleets were tapped for war service, while German submarines prowled the Caribbean for Allied merchant and military vessels. As a result, briefly during the '40's, importers resorted to overland shipments through Mexico to maintain a much-reduced wartime banana trade (just 25 million stems in 1943).

CAREFUL HANDLING

Fruit Dispatch Co., established by Andrew Preston in December 1898 as a sales and distribution organization and absorbed three months later by the new United Fruit Co., oversaw delivery of bananas from ports to wholesale "jobbers." By the 1940's, Fruit Dispatch had more than 50 offices across North America, serving nearly 2,000 jobbers; Standard Fruit, a distant second, maintained a similar but smaller operation (from 1935 to 1953, UFCo accounted for 63 percent of all bananas reaching North America).

The weekly banana market was set by the amount of fruit cut in the tropics; sales forces went to work when the cargo was at sea. Sales offices worked hard to minimize "rollers"—carloads of bananas on their way inland from port but as yet unsold, and temporarily consigned to intermediate distribution terminals such as Fulton, Ky., on Illinois Central or Cumberland, Md., on Baltimore & Ohio.

When bananas were in the railroads' care prior to World War II, employees of Fruit Dispatch and other sales offices, known as "messengers," rode along, usually in the caboose but sometimes in special caboose-like cars, to shepherd the sensitive cargo; they would deadhead back to home ports on special passenger tickets. Banana messengers monitored the loading of the refrigerator cars at ports of entry and checked car and cargo temperatures frequently en route. In later years, resident messengers stationed at strategic on-line points assumed these responsibilities.

Prior to 1916, banana ships were loaded and unloaded manually, with stems passed from man to man between ship's hold and wharf. The introduction, at larger terminals, of continuous canvas-pocket vertical conveyors that reached down into ships' holds expedited both loading and unloading, and eliminated much of the handling that could damage the fruit. Lifted from conveyor pockets, stems were graded on the wharf for size and quality before moving on horizontal belt conveyors toward waiting reefers.

In the mid-1950's, about 84 percent of bananas were shipped by rail beyond U.S. ports; the remainder went on trucks for shorter hauls. Typically, cleaned reefers were loaded with stems placed on end, upside down (bananas grow with the ends of the fruit "fingers" pointing skyward). As stevedores loaded a car, shouldering one stem at a time, they stepped on a treadle counter that tallied the stems; cuts of loaded cars were then pulled from wharf tracks and weighed.

A typical carload was 300 stems (10 to 12 tons), and more than 200 reefers were needed to unload large postwar ships. In warm weather, cars were iced and precooled to the required 55–60° F. in-transit temperature range, and ventilated to dissipate heat and ethylene gas generated by the ripening fruit. In colder climes, oil or charcoal heaters were placed in cars' empty ice bunkers to maintain the safe

Where Illinois Central hit the century mark

PHOTO, J. SCHMIDT, KRAMBLES-PETERSON ARCHIVE; EMD ADVERTISEMENT, JEFF HAMPTON COLLECTION

IC's *City of New Orleans* slams the TP&W diamond at Gilman, Ill., in the mid-1950's, en route to Champaign . . . and 100 mph.

Notwithstanding the urgency with which Illinois Central moved bananas northward, the railroad's post-World War II reputation for speed was nowhere more evident than on the Champaign District, the 122.2-mile, double-track stretch of the Illinois Division between Champaign and Branch Junction. This latter obscure point, on the northern outskirts of Centralia (a town named for the railroad, as in "Central") was where the "Chicago Branch" diverged from IC's original "charter line" up through the center of the state.

This raceway through the Prairie State's cornfields had a posted passenger-train speed limit of 100 mph for most of its length. IC was one of a select few U.S. railroads to permit train operation at the "century mark." By the mid-1960's, though, other roads such as Santa Fe and Atlantic Coast Line had quit the "century club," leaving IC as the last operator of America's fastest passenger trains in the pre-*Metroliner* era.

Where railroads chose to venture beyond 79 mph, train-control hardware was mandated by the Interstate Commerce Commission after 1947 ["Speed, Signals, and Safety," pages 38-47]. Illinois Central employed a "continuous" Automatic Train Stop (ATS) system, incorporating dual-aspect (clear or restricting) cab signals. Safe operation in this speed range on IC was made possible by an impeccably maintained main line with only one restricting curve (near Tuscola, 22 miles south of Champaign, where trains had to slow to 90 mph) and slower passages through two communities, Mattoon and Effingham.

In the mid-1960's, five IC trains were authorized to run at 100 mph over the Champaign District—and did so for miles at a stretch, their brown-and-orange E units, which were geared for 116 mph, charging through the countryside with throttles wide open. (The best that IC's coal-black passenger-service GP9's could muster was a still-respectable 83 mph. They tended to be used on IC's Iowa Division trains and secondary runs in the South.) IC still ran plenty of passenger specials through the 1960's—catering to school, civic, and athletic events and whose consists boasted roller-bearing-equipped heavyweight cars—and these, too, brushed 100 mph across the Champaign District.

Leading the pack of Illinois Central speedsters was the *City of New Orleans*, inaugurated in 1947 as a 16-hour day train linking its namesake Crescent City with Chicago. Its modernized and streamlined heavyweight cars—rebuilt in the road's Burnside Shops in Chicago—are remembered for their glass-smooth performances over the Champaign District, on a par with, or better than, the lightweight cars on the overnight, all-Pullman *Panama Limited*.

Even as Illinois Central condensed and recast its passenger services after 1967 under the guidance of Paul Reistrup, the railroad's 100-mph operation on the Champaign District persisted. A post-Amtrak reduction to 90 mph—the previous maximum elsewhere on the IC—made track-maintenance costs more palatable. Operation above 79 mph came to an end when IC's main line was single-tracked, and the ATS system removed, in the late 1980's.

—Kevin J. Holland

TWO PHOTOS, J. DAVID INGLES

With a caboose-red banana-messenger car tucked in behind its three GP9's, an Illinois Central train approaches Homewood, Ill., and Markham Yard in June 1960. Note that this is not a full banana train, just a cut of reefers ahead of a mixed-merchandise consist.

range; winter loads consigned from the Gulf to the upper Midwest or Canada could switch from ice to heat en route, based on messenger assessments. At northern ports, bananas were sheltered between ship and railcar during cold weather, lest they be "chilled" and ripen with a dull, striated peel.

Arriving at jobber or retail consignees after a rail trip from the port, stems were hung in climate-controlled rooms where ripening was completed over several days. The "hands" (bunches) of fruit—up to nine per stem—were removed and trimmed into smaller "clusters" for retail sale.

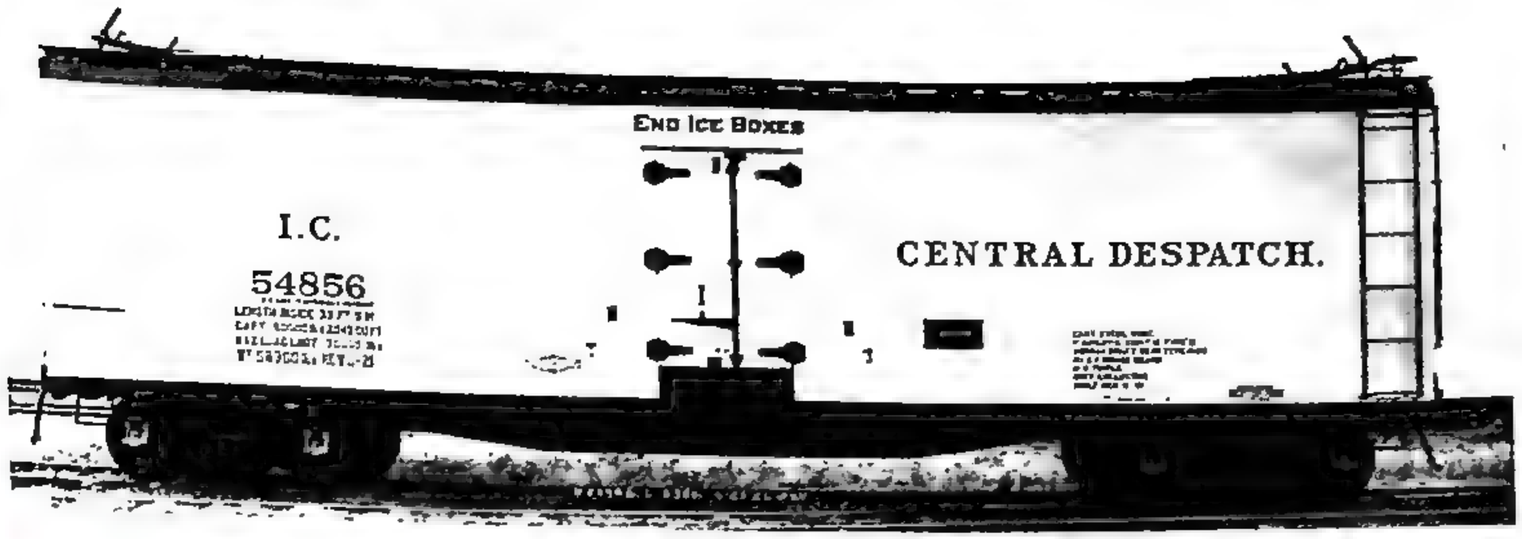
THE "BANANA ROAD"

Illinois Central was the premier banana-hauler because it capitalized on its strategic location, pursuing traffic from the industry's formative years by working with importers and port interests to develop optimum shipping methods, facilities, schedules, and equipment. IC General Superintendent Joseph Tucker initiated rail shipment of bananas from New Orleans in 1880, and within five years, IC handled almost 1,800 carloads, which grew to 8,000 at the turn of the 20th century. By 1921, bananas accounted for almost 30 percent of IC's annual perishable freight revenue (including meats), and were the most lucrative perishable commodity it handled. IC even celebrated its primacy by naming a sleeping car *Banana Road* (built for the 1942 *Panama Limited*). Bananas were shipped year-round, with traffic typically heaviest from May to July.

From a post-Depression peak of 2,644 cars owned in 1942, IC owned a steadily dwindling number of ice reefers. Contemplating its reefer fleet after the war, IC management in 1945 allocated $15,000 for construction of an aluminum refrigerator car, designed along with Alcoa and the United Fresh Fruit & Vegetable Association, a national growers' and shippers' organization. IC's shops in McComb, Miss., turned out the state-of-the-art, cushion-underframe, ice-cooled car, No. 51000, in September 1946. Although the car was 6¼ tons lighter than contemporary steel reefers, its high initial cost discouraged repetition, and the unpainted car remained an experimental curiosity on IC banana trains. It survives today at the McComb Railway Museum.

Rather than replenish its own fleet as elderly wood-bodied cars were retired, IC met postwar needs with steel-bodied, ice-bunker cars leased from Merchants Despatch Transportation (MDT) and Northern Refrigerator Car Co. (NRC), mostly dedicated to banana service and stenciled accordingly.

Most bananas arriving in New Orleans departed under IC's care. "The Main Line of Mid-America," as IC called itself, carried 52,250 carloads of bananas—almost 16 million stems, or more than one quarter of the continent's total annual imports—in 1947, the year in which immediate postwar U.S. imports and per-capita consumption of the fruit peaked. Congestion and strikes in 1946, '47, and '51 limited the banana-handling capacity of U.S. ports on the Atlantic and Pacific coasts, so New Orleans and Illinois Central took up the slack.



PULLMAN PHOTO, DON HORN COLLECTION

BOB'S PHOTOS

ILLINOIS CENTRAL PHOTO, DON HORN COLLECTION

Banana-hauling reefers progressed through the years: IC 54856 is a wooden car from 1921; NRC 16738 got IC's new image in 1967.

These traffic patterns didn't last, though. More pervasively, advances in processed, frozen, and packaged foods ate away at North American fresh fruit consumption during the 1950's. A low point, for importers *and* railroads, was reached in 1956, when only about 47 million banana stems were landed at U.S. ports, although New Orleans' importance actually boosted IC's carloadings that year.

IC reigned by exploiting its 921-mile trunk's high-speed potential, particularly up through Illinois, and by giving bananas priority over other traffic. In the postwar era, banana trains—often of up to 100 reefers—were marshalled at IC's Stuyvesant Yard in New Orleans. UFCo fruit was discharged nearby at its Thalia Street wharf, served directly by IC's compact Levee Yard near the foot of Canal Street. Reefers loaded at Standard Fruit's Desire Street wharf reached IC via the New Orleans Public Belt Railroad.

When destined for Chicago, the bananas' journey often would end at IC's congested South Water Street terminal, its literal north end set between Michigan Avenue and the lakeshore, or at the Chicago Produce Terminal, a wholesale market opened in 1925 on the Near West Side. One point short of downtown that saw heavy banana interchange was Harvey, Ill., where IC would give bananas to Grand Trunk Western for hotshot No. 492 [page 36] to forward to Toronto, Ontario.

Fulton, Ky., roughly halfway between New Orleans and Chicago, was an operational crossroads for IC, a pinch point through which all of the road's Deep South–Upper Midwest traffic had to pass. There, blocks of northbound banana reefers not going toward Chicago were redirected to St. Louis or Louisville, Ky., and connections beyond. Bananas transloaded at Mobile and forwarded by Gulf, Mobile & Ohio, IC's future merger partner (in 1972), also reached Fulton, via interchange at nearby Rives, Tenn.

Ideally situated, Fulton became IC's main refrigerator-car icing station following facility improvements in 1948; a car-heater depot was also part of the complex. An icing platform almost 2,800 feet long served two through tracks in the Fulton yard; banana trains were inspected, serviced, and (if necessary) reblocked there before continuing north. Rarely would a banana train linger at Fulton for more than two hours.

Postwar banana trains typically reached Fulton, 516 miles from New Orleans, within 24 hours of loading; a further 12 to 16 hours was needed to reach Chicago (via

J. PARKER LAMB

LIBRARY OF CONGRESS

Gulf, Mobile & Ohio also hauled bananas, interchanging with IC at Rives, Tenn., near IC's hub of Fulton, Ky. In December 1950, two GM&O FA's leave Meridian, Miss., with a train bound for St. Louis. In 1937, workers load a refrigerated boxcar at Mobile, Ala.

the Edgewood Cutoff). During the late steam era, 2-8-2 Mikado locomotives prevailed on IC banana trains south of Memphis, while 4-8-2 Mountains sped the traffic up the railroad's Illinois Division; they all were succeeded by IC's ubiquitous black GP9's. Of comparable urgency was maintaining a steady flow of reefers back to the Gulf to meet the next banana ship.

END OF AN ERA

A fungus helped end the banana-railroad marriage. Among hundreds of known varieties of bananas, few are suitable for widespread cultivation and consumption. Until the late 1950's, the Gros Michel was the "standard." Its tough peel and tightly clustered stems held up in transport, while predictable ripening and large, tasty fingers pleased jobbers and consumers. By the 1920's, though, growers were wrestling with the Gros Michel's "Achilles heel," a soil-borne fungus—known as Panama disease for where it first appeared—that quickly decimated plantations. For several decades, the "cure" was to abandon infected plantations in favor of newly cleared and propagated land, but the fungus kept pace.

In the early '50's, Standard Fruit began cultivating Panama-resistant Cavendish bananas, smaller and less flavorful and with a delicate, bruise-prone peel requiring greater care in handling, shipment, and ripening. UFCo, believing that customers would resist any change from the Gros Michel, delayed converting to Cavendish until after a 1959 management change. By 1963, however, the shift was all but complete. The industry had averted a crisis, but the scope and timing of the change led to the demise of banana traffic on North American railroads.

With the shift to Cavendish came an upheaval of packing and shipping methods. In a process borrowed from Canary Island growers and championed by Standard Fruit in 1957, Cavendish bananas were cut from stems and trimmed into retail-sized clusters in the tropics, then washed and packed in the now-familiar 40-pound-capacity corrugated cardboard boxes that would protect them all the way to the retailer.

Cavendish fingers protrude from the stem more than Gros Michels, and during early-1950's evaluation shipments, continuing the old method of on-stem shipping incurred heavy losses of salable fruit owing to crushing and bruising. Cavendish stems also were weaker, unsuited to the hanging required by Gros Michel

ripen... handling methods. This was a con... ...ce Cavendish varieties requi... ...ore elaborate and precise ripening regimen.

Boxing, therefore, was required to maintain quality; collateral benefits were removal of the stem's deadweight (15 percent of shipment weight), and the means to transform a commodity into a branded consumer product. Moved by narrow-gauge plantation railroads to tropical piers, filled boxes were loaded break-bulk into growers' refrigerated ships and offloaded at U.S. banana ports using the conveyors that had handled stems.

The reinvention of tropical handling methods brought about by Panama disease would, quite incidentally, prove lethal to railroads' banana-traffic prospects. By the time the transition was complete in the early 1960's, refrigerated trucks—a recent development—were on their way to taking the banana business from the railroads. Shipping Gros Michel stems by truck over even moderate distances wasn't widely embraced—as late as 1960, some consignees in New Jersey still employed trains to move their stem fruit over the 20-odd miles from New York harbor. Boxed bananas' relative ease of handling, however—coupled with mechanical temperature-control advances on ever-larger trailers exploiting the growing Interstate Highway System—gave trucks an advantage.

Boxed bananas were still shipped by rail, but in declining numbers. The boxing process—largely through elimination of the stem—meant that fewer reefers were needed to move an equivalent tonnage of salable fruit. In 1966, IC still carried almost 11,000 carloads of bananas, and the traffic persisted long enough to move in reefers wearing IC's new "split-rail" logo of 1967, but by 1971, carloadings had plummeted to just 360 (a 75 percent decrease from the 1,466 cars in 1970). In just over a decade, changes brought about by Panama disease had ended a colorful chapter in North American fast-freight railroading.

The loss of banana carloadings was mitigated by the simultaneous—and explosive—growth of trailer-on-flat-car (TOFC) and auto-rack business. Illinois Central, most directly affected by the shift in banana traffic, saw its annual TOFC loadings quintuple between 1958 and 1961, from roughly 3,000 to more than 15,000.

"We just gave it up," says Paul Reistrup, when asked about the last years of carload banana traffic on the IC. As Vice President, Intermodal Services and, later, V.P., Traffic, Reistrup pressed instead for lucrative new piggyback business from United Parcel Service, running premier

ROBERT CHASE

Even Baltimore & Ohio hauled bananas, out of its Maryland home city. This could well be a cut of the fruit up front behind the FT diesels in the Cumberland (Md.) Narrows circa 1948.

speeds, as well as landing new grain and coal business that made banana traffic—and its expensive supporting infrastructure—expendable.

"We might have won it back," says Reistrup of the banana business, but IC's late-1960's and early-1970's traffic sales force concentrated instead on regaining another perishable commodity eroded by truckers: Iowa meat.

Reistrup had a more direct involvement in the rail shipment of bananas during his time as General Yard Master on Baltimore & Ohio in the 1950's. "We ran 'Banana Specials' out of Baltimore," he recalls. "They were hot trains—always diesel-powered." The industry-wide shift from stems to boxes and from railroad cars to trucks, though, meant that the attention paid by B&O to its banana traffic—opening a new Baltimore banana pier in the late 1950's, for example—went unrewarded.

Bananas stayed on the fringe of the TOFC traffic mix for several reasons. Load conditions were more difficult to monitor and adjust en route, even with side-door trailers. Speed helped—trucks employed by banana consignees gathered at wharves just as ships' boxed cargo was cleared for discharge. With trailers loaded, drivers made a beeline for the nearest Interstate, often arriving at their destinations hours sooner than was possible with TOFC as it then existed.

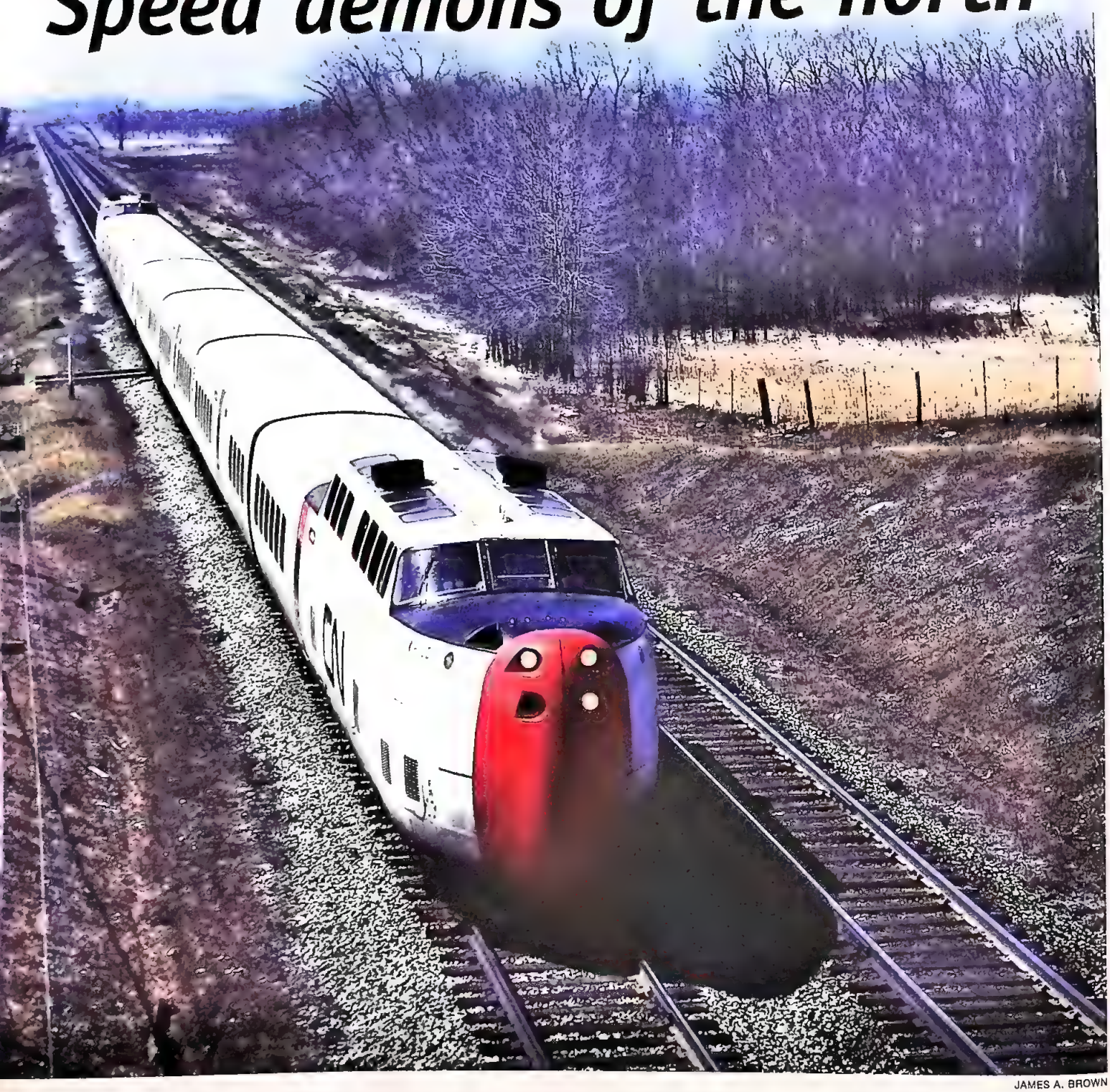
In the early 1960's, just as trucks were taking their first bites from the railroads' banana business, rate differentials between piggyback and carload rail shipment didn't exist; there was no inducement for price-sensitive shippers of time-sensitive bananas to move trailers off the highway.

An experimental 1963 overland shipment of boxed bananas from Guatemala to a Texas jobber made industry headlines, suggesting that railroads might yet have a role. Trucked from packing sheds to a Nacionales de Mexico railhead, four refrigerated containers of bananas were forwarded to San Antonio aboard flatcars in NdeM and Missouri Pacific passenger-train service in a four-day trip billed as "the first international rail piggyback shipment of bananas" over this route, cutting the shipping time in half.

Two decades would pass, however, before containerized movement of boxed bananas to North America—aboard a new generation of banana ship—became common. "Premium" boxed bananas, loaded in then-standard 40-foot refrigerated containers in the tropics, were introduced by Standard Fruit successor Dole in the early 1980's, and within a decade or so containerized, palletized shipment of 40-pound banana boxes direct from the tropics to jobbers and retailers eliminated the last avoidable handling steps and became the industry standard. With containerization complete, the older banana terminals—beyond a few preserved ice refrigerator cars, the last tangible links to the railroads' pre-eminence in North American banana distribution—were closed and dismantled. ■

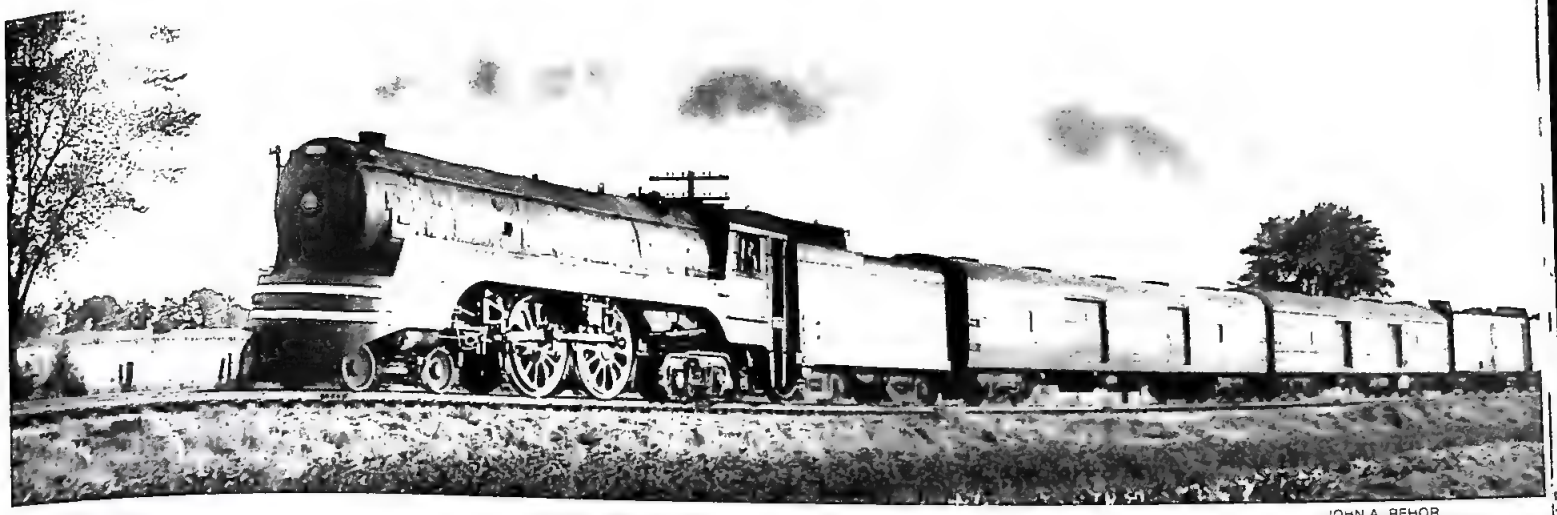
Speed Bursts

Speed demons of the north



JAMES A. BROWN

Turbo turf: Designed in 1957 by Alan R. Cripe, United Aircraft's TurboTrain hit the rails in the Mod '60's. In the U.S., Turbos ran between Boston and New York during 1968–76. Canadian National put them in Toronto–Montreal service in '68, but reliability was 6 years in coming. On April 22, 1976, one of them made 140.6 mph, still the Canadian rail speed record. By then, the LRC trains were on the horizon, and VIA Rail Canada retired the Turbos in September 1982. In happier times, CN power car P100 leads a test train near Oshawa, Ont., on April 6, 1968.



JOHN A. REHOR

The speedy Jubilee: Canadian Pacific's five streamlined F2a 4-4-4 Jubilee types of 1936 bore more than a passing resemblance to Milwaukee Road's class A 4-4-2's. Although the Jubilee's drivers measured "only" 80 inches, F2a 3003 set, and kept, the Canadian steam speed record of 112.5 mph on September 18, 1936, near St. Telesphore, Que. Near sunset, class leader 3000 keeps a more relaxed gait with Windsor–London, Ont., train 634 at Glencoe on July 25, 1957.

JAMES A. BROWN

Fast in any language: Before the Turbos, CN's pro-passenger policy was most evident in the *Rapidos*, a family of trains with conventional, albeit dedicated, equipment. Toronto–Montreal service began on October 31, 1965, with a daily round trip that blazed over the 335 miles in 4 hours 59 minutes, averaging 67 mph. A *Rapido* engineer has his FP9 in Run 8, the speedometer crowding 90.

A strong closing

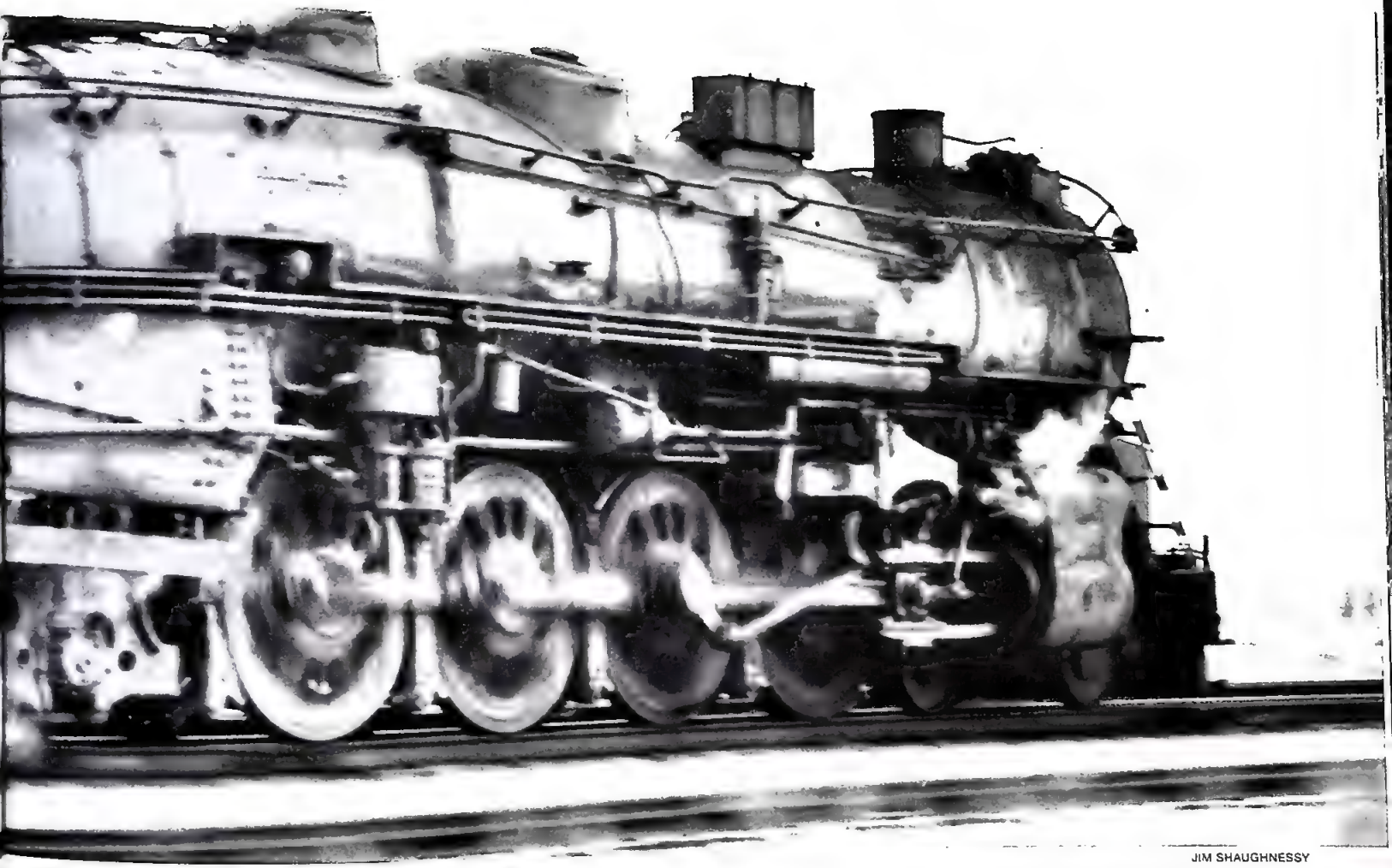
A 1952 night to remember—when an O-5A relieved E units on the Burlington Route's *Coloradoan*

BY **MIKE MARTIN**

The time was spring 1952, and I was 12 years old. My parents and I were returning from a brief stay in Denver, where my father, an attorney for the Chicago, Burlington & Quincy Railroad, had business. Of course we traveled by train, which I absolutely loved. Riding a Burlington train usually meant a high-speed ride in a stainless-steel *Zephyr*, but on this trip, for reasons I cannot recall now, we returned home to Chicago not on the *Denver Zephyr*, and not on the new (1949) *California Zephyr*, but on the workhorse *Coloradoan*, train No. 6.

The *Coloradoan* followed its stainless-steel brothers out of Denver around 9 p.m., worked a dozen stations across Colorado and Nebraska overnight, and arrived in Lincoln and Omaha at 7 and 8 o'clock, respectively, the next morning. It usually had 8 to 10 head-end cars plus heavyweight coaches and a heavyweight Pullman sleeper, plus a parlor-diner east of Lincoln. Continuing

performance



JIM SHAUGHNESSY

Representing the unknown Burlington O-5A that sped the author to Chicago in 1952 is 5634, racing eastward through Illinois in 1957.

on the next day, the *Coloradoan* followed No. 32, the *Mail*, across Iowa, making fewer stops, but from Burlington, Iowa, on to Chicago, had more than a dozen flag and positive stops. The *Coloradoan* provided mail, express, and passenger service to the prairie towns on "the Q's" main line, enabling the mighty and more glorious *Zephyrs* to make fewer stops on their 1,034-mile race from Denver to Chicago.

I remember clearly that spring morning in Lincoln, when we went to breakfast in the diner. We were still sitting, motionless in the station, as men and switch engines worked our train unloading mail and express, setting out cars, and adding the Pullman sleeper that came in from Great Falls (on the Great Northern) and Billings, Mont. This train did what the Q advertised, reflecting the "Everywhere West" slogan splashed on the side of CB&Q freight cars and diesel switchers and hood units.

As the morning and then the afternoon wore on, we stopped at various stations: Creston, Albia, Ottumwa, and Burlington, among others. I remember the distinct aroma of the depots, the sounds of mail-and-baggage trucks clattering down the brick platforms, the excited exchanges as people met in these rural towns. Our train was powered, as I recall it, by two big silver E7's or E8's.

In late afternoon we crossed the Mississippi River from Burlington and rolled on to Galesburg, Ill., arriving well over an hour after our 4 p.m. scheduled time. At this point, I must digress a bit from the day's events. Even as a boy, I took it personally when a train was late. People who were guests of the CB&Q that day in 1952, even on a workhorse train like the *Coloradoan*,

needed to be delivered to Chicago on time. Well, here we were at Galesburg, 150 miles out, and more than an hour late with a heavy train.

During the Galesburg stop, my father and I strolled up to the head end for a brief minute after dinner. Wait! What is this? To my surprise, and yes, subdued excitement, the E units are being cut off and . . . is this real? . . . a muscular O-5A class 4-8-4 Northern steam locomotive is backing in, ready to couple up to our train! (As a youngster, all I could really see was the huge outline of the tender getting closer to our lead car as evening darkness fell on the busy CB&Q town.)

My father and I headed quickly back to our Pullman space. The O-5A to me was, without a doubt, the Q's most elegant steam power. And it could run! This was like an old relief pitcher coming out of the bullpen in a crucial ball game. Today they call relief pitchers who take the mound in the late innings of the game a "closer." Well, this old-timer O-5A was going to give it a nice try, but no way, I thought, was it going to "close the game out" and get our train to the bumping post at Chicago Union Station on time.

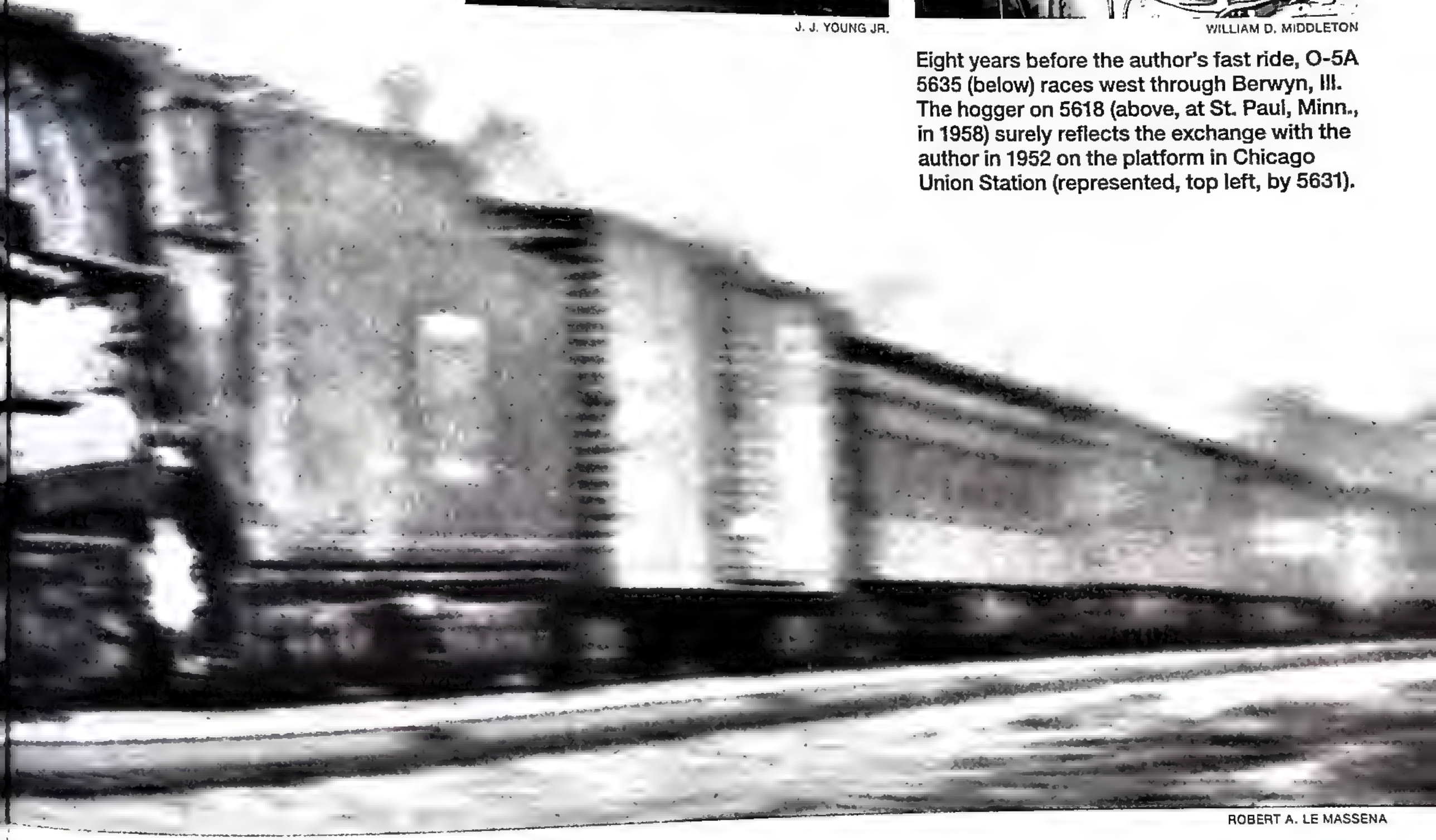
Back on the rear of the train, I watched as we marched out of Galesburg and headed east. For my entire life, the run from Galesburg to Chicago on the double track has been a thrill. It represents the best in railroading. Here we were, with steam on the head end, and the race was on.

And what a race it was! We flew through those little Illinois towns, pounding over switch points, the sounds of crossing signals whizzing by. There goes a depot, and we're heading to the next town. Gosh, it was great! As we'd lean around a curve, I could see those magnificent driving wheels pounding away,

J. J. YOUNG JR.

WILLIAM D. MIDDLETON

Eight years before the author's fast ride, O-5A 5635 (below) races west through Berwyn, Ill. The hogger on 5618 (above, at St. Paul, Minn., in 1958) surely reflects the exchange with the author in 1952 on the platform in Chicago Union Station (represented, top left, by 5631).



ROBERT A. LE MASSENA

headlight reaching ahead, warning all that on this night, on this track, on this railroad, this locomotive, like a great racehorse, was giving a great account.

We stampeded into Aurora, 38 miles away from Chicago. Putting it mildly, it was not a long station stop. We whistled off, and the O-5A stomped out of town, smoking it up all over the place. With my dad, I looked at my watch. We had made up almost an hour, but had only about 30 minutes to make Chicago on time. This was going to be close.

The next scene is the one that has motivated me to write this account so many years later. We arrive at Union Station, and as so many have done before and since, my family and I begin the long trek toward the station from the rear of the train up to the head end at the bumping post. By this hour, the dining car is dark. The coaches have been unloaded as we pass by them. There still is activity around the baggage cars, and of course, the RPO is alive with the mail clerks toiling on. We walk past all this.

There, ahead of me, then, is a view I will never forget: The big, squarish tender with the large "Burlington Route" rectangle emblem, then the veteran engineer looking down at me from his cab seat. I look at my watch, then look up at this old "hoghead" who has done this a thousand times before. He smiles down at me and gives the thumbs-up sign. Do other people realize what has just taken place?

Now the sights and sounds of this massive but resting steam locomotive are upon me . . . the gentle sound of steam escaping, the heat I can feel from the firebox, those tall drivers, which to a boy of 12 look huge. We begin walking up the ramp into the station. As we reach the top, I look back at that magnificent O-5A racehorse. A closer, indeed. We are on-time into Chicago! ■

Speed Bursts

Fast freight!

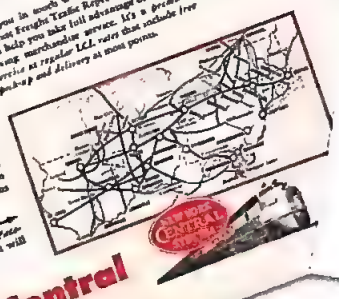
Fast Frequent Dependable FREIGHT SERVICE
Between NEW ENGLAND AND ALL POINTS IN THE UNITED STATES AND CANADA
THE NEW HAVEN is fully prepared to move the rapid trends of industry — transporting both the raw materials and the finished products over a dependable network of mind to mind from all points in the United States, Canada and Mexico.
The speed of New Haven Fast Freight Service is shown on the map above. There are overnight deliveries from New Haven Railroad gateways to such important cities as New York, Philadelphia, Baltimore, Albany and Portland. Second morning delivery to and from points as far distant as Pittsburgh, Harrisburg, Detroit, Cleveland, Atlanta and Richmond. Third morning delivery to and from points as far distant as Chicago, St. Louis and Birmingham. Similar fast service is rendered all the way to the Pacific Coast!
The New Haven's conveniently located Terminals, with ample yard room for both deliveries and its Terminal Markets in Boston, Providence and New York, are of modern design and are operated with the greatest efficiency, assuring rapid sorting and delivery of less than carload shipments, thus practically bringing the ends of the New Haven right to the doorsteps of shippers' plants and leaving the responsibility for traveling with one dependable transportation agency!
THE NEW HAVEN'S fast fleet of merchandise flyers which deliver unexcelled, all weather, on time coordinated freight service is led by the "Famous 4 Overnighters."
"THE SPEED WITCH"—the pioneer of the "Famous Four" provides excellent overnight service between Boston, Southern New England and Newark, Trenton, Philadelphia and as far South as Baltimore!
"THE ROUND UP"—as the top notch overnighter between New York, Providence and Boston and gives shippers the added advantage of a late closing hour permitting manufacturers full day operation with assurance of early next morning delivery!
"THE CANNON BALL"—is a fast overnighter handling fish, perishables and other freight from Boston, Providence, Cedar Hill and Brooklyn Freight Terminals and piers for fastest South and West!
"THE MAINE BULLET"—is the hot shot handling merchandise, perishables and other freight from and to Terminals and piers in Maine, New Hampshire, Vermont, Southern New England, New York (Harlem River Yard, New York Piers) and points West!
In addition a large fleet of trains connect with "The Speed Witch," "The Round Up" and "The Cannon Ball" at Providence, New London and Cedar Hill . . . extending the New Haven's efficient service throughout a great area!
The New York New Haven & Hartford Railroad Co.
SHIP VIA THE New Haven RAILROAD

It's New York Central's system-wide PACEMAKER merchandising service—saving a day on the way!

Growing! Growing! Growing! Barely four years old—Pacemaker knockdown-cartload service began with one fast overnight run between New York and Buffalo. Now it links all cities on New York Central . . . and most smaller towns, too, through closely coordinated high-speed freight trains and highway transportation.

For Modern Merchandisers. Pacemaker service is tailored to fit today's small-inventory, high-turnover merchandising. It lets you supply customers throughout the New York Central area—swiftly, dependably, at any weather . . . from fewer main distribution points. That means big savings in overhead for you.

If You Distribute Anywhere, in this area or throughout the nation, find out about Pacemaker freight. Your local freight agent will put you in touch with New York Central Service Freight Traffic Representative . . . who can help you take full advantage of this day-saving merchandise service. It's a precision service at regular LCL rates that include free pick-up and delivery at most points.



New York Central
The Standard Water Level Route

—thanks to General Motors, the biggest builder of locomotives in the world

THE locomotives you see here in the world and yet headline heavy leader ever to

It possesses an even greater share of experience in building the nation's gasoline-electric locomotives that will pioneer the track of National Defense.

It combines the longest freight locomotive experience with the shortest locomotive experience. It has more than a million miles of road testing behind it, but as unusually fast-moving crack freight with all of diesel-electric design—a large coaching through diesel-electric locomotives without stopping to refuel for at least 800 miles.

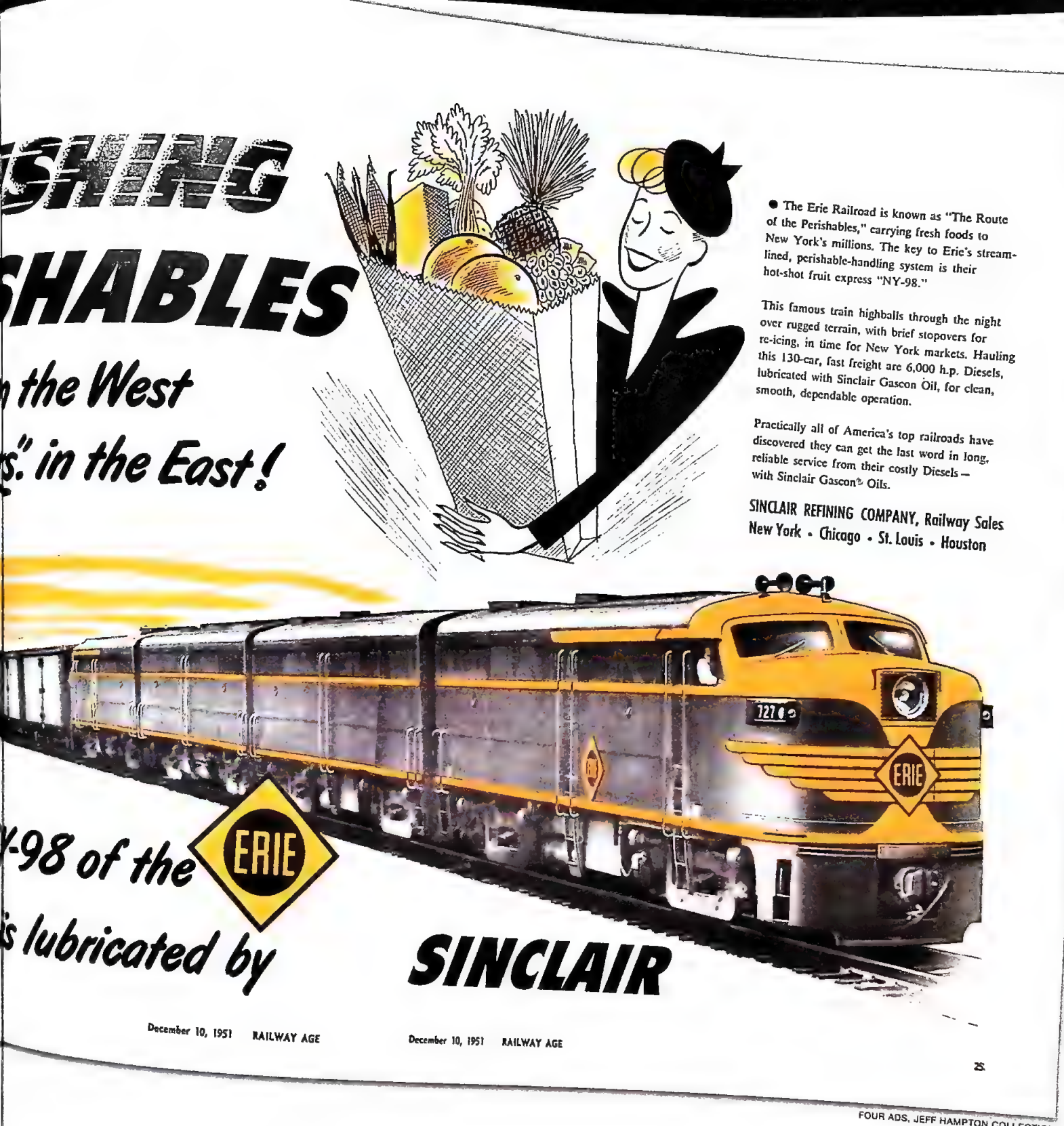
It is right for America's future because it has proved its right for America's past.

And like the motor transport of Automotive it is the product of General Motors—from whose Lake and land long experience has been buying its greatest number of locomotives in the past three years.

The success, of course, does not begin and ends in production—with the diesel engines, electrical equipment, frames, trucks and other parts all made and factory—from which they will all be used.

GENERAL MOTORS LOCOMOTIVES

SEE THE MOVIES COMPARATIVE Performance of General Motors Locomotives


SHING
SHABLES
the West
s." in the East!
• The Erie Railroad is known as "The Route of the Perishables," carrying fresh foods to New York's millions. The key to Erie's streamlined, perishable-handling system is their hot-shot fruit express "NY-98."
This famous train highballs through the night over rugged terrain, with brief stopovers for re-icing, in time for New York markets. Hauling this 130-car, fast freight are 6,000 h.p. Diesels, lubricated with Sinclair Gascon Oil, for clean, smooth, dependable operation.
Practically all of America's top railroads have discovered they can get the last word in long, reliable service from their costly Diesels—with Sinclair Gascon® Oils.
SINCLAIR REFINING COMPANY, Railway Sales
New York • Chicago • St. Louis • Houston
ERIE
ERIE
Y-98 of the
s lubricated by
SINCLAIR
December 10, 1951 RAILWAY AGE
December 10, 1951 RAILWAY AGE
25

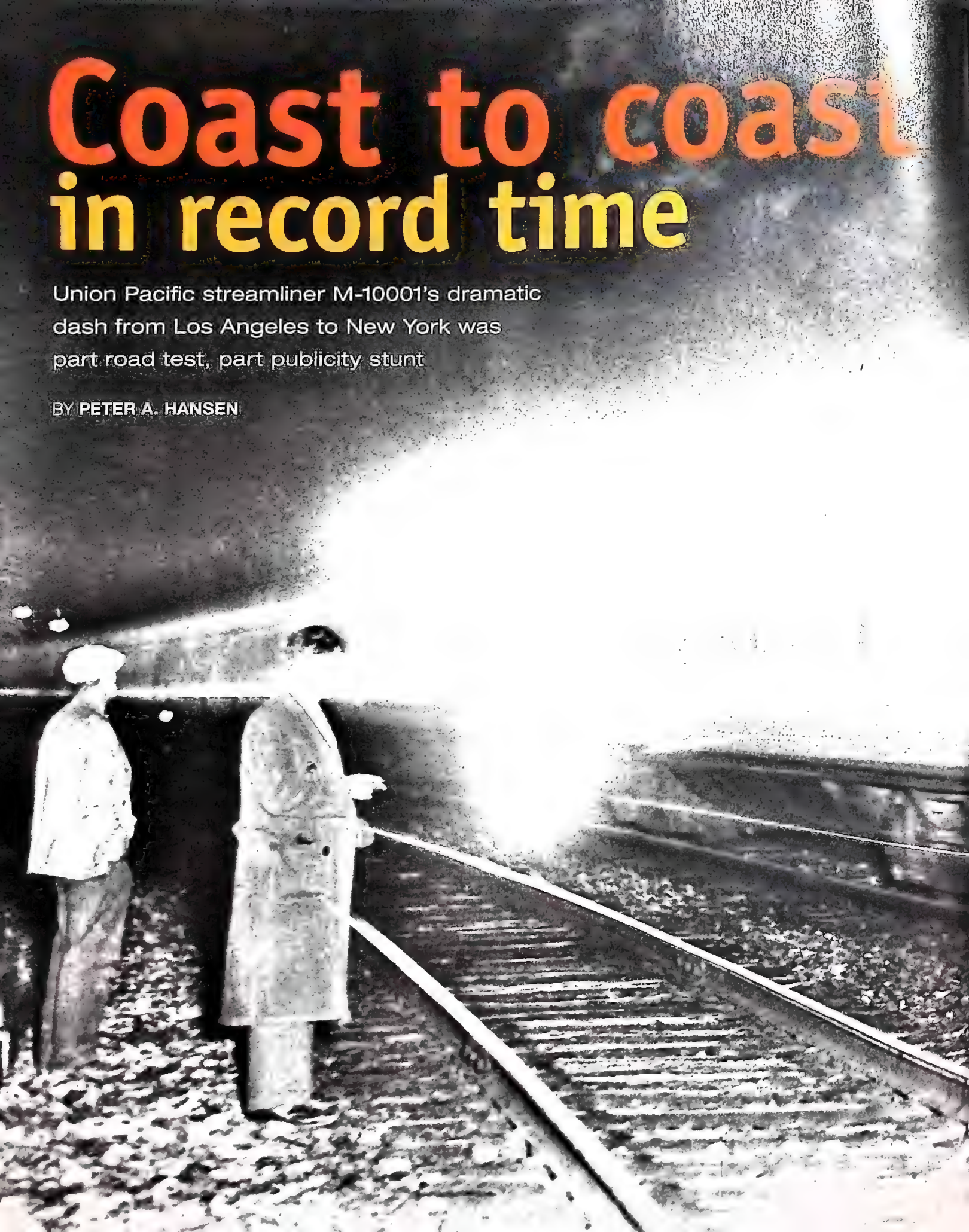
FOUR ADS, JEFF HAMPTON COLLECTION

Passenger trains are supposed to go fast—or at least it's not unusual for them to do so. Freights, on the other hand, can be the very definition of pokiness. So there's a certain magic in the idea of a fast freight, as four magazine ads suggest. In a New Haven ad (upper left, source unknown), the names of its "Famous 4 Overnighters"—*Speed Witch, Round Up, Cannon Ball, Maine Bullet*—quicken the pulse. New York Central (far left, August 21, 1950, *Newsweek*) compares Pacemaker freight service to the *20th Century Limited*. General Motors (August 16, 1941, *Saturday Evening Post*) touts its FT diesel. Finally, Sinclair Oil (December 10, 1951, *Railway Age*) invokes the speed of Erie hotshot NY-98.

Coast to coast in record time

Union Pacific streamliner M-10001's dramatic dash from Los Angeles to New York was part road test, part publicity stunt

BY PETER A. HANSEN



UNION PACIFIC RAILROAD MUSEUM

Bob Lovett was worried. Union Pacific Chairman W. Averell Harriman had pushed for the development of a radically new train, unlike anything that had ever been seen on American rails. It was low in height, light in weight, aluminum in construction, and streamlined in design. It owed as much to aircraft construction as it did to railroading. And it was powered by an internal combustion engine. It would be called the M-10000.

Harriman wanted to stage a high-risk publicity stunt, running the little yellow train at record speed from Chicago to Washington, D.C. If the futuristic train and its pace weren't enough to guarantee good press, he intended to invite President Franklin D. Roosevelt—more than an acquaintance, but not quite a friend—to ride the M-10000 from Washington to Baltimore.

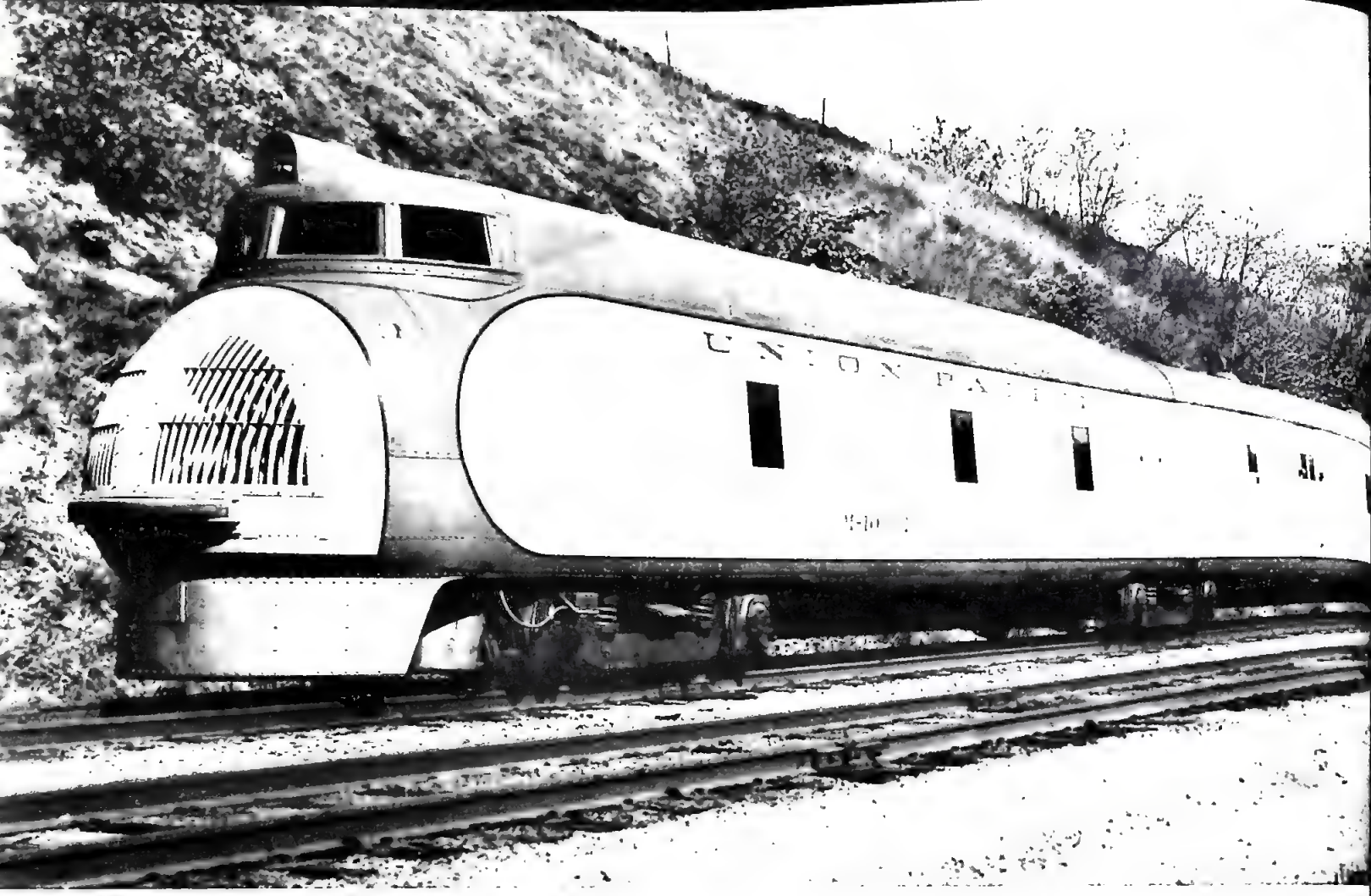
On the Union Pacific Railroad of 1934, as things had been for the previous 36 years, what a Harriman wanted, a Harriman generally got. Lovett had to tread carefully. But if anyone could rein in Averell's high-spirited instincts, Lovett was the man. Himself a UP board member, Lovett's father had been the confidant and successor to Averell's father, the renowned E. H. Harriman. From Groton to Yale to the Brown Brothers Harriman & Company banking house, the ties between the two families were many and strong.

"We have a brand-new, untried train," Lovett wrote in an early February letter to Harriman. "It will not get much of a workout after the christening in Chicago. Now assume a lot of advance publicity is put out about its arrival in Washington and that, when there, it will be inspected by the President and other notables, and then assume that, after all this hullabaloo it jumps a switch point and gets cracked up, or some bad engineering bug develops in it and makes the affair a fiasco. It seems to me that it would retard the whole program of speed trains so much as to make it awfully unwise to run such an unnecessary risk."

Harriman blinked. The M-10000 would go to Washington at a more sedate pace, and FDR would spend a half hour touring the train on February 15, though he didn't ride it to Baltimore. Still, it was the first American streamliner, and that was enough to get more than 1 million of the President's fellow citizens to walk through the train on its ensuing nationwide tour. UP people gave it the affectionate nickname of "Little Zip."

But Harriman was still itching for a publicity stunt. The distillate-powered M-10000 had performed well on its tour, but perhaps just as important, the Chicago, Burlington &

UP's M-10001 diesel streamliner is on New York Central rails as it streaks though Rochester, N.Y., during its record-setting coast-to-coast run of October 22–25, 1934.



Quincy staged an event with a streamliner of its own. On May 26, the Burlington ran its new *Zephyr* from Denver to Chicago non-stop—an unheard-of accomplishment in an age when steam locomotives had to be watered and fueled every hundred miles or so. From dawn to dusk, the *Zephyr* covered its 1,015-mile route in 13 hours 5 minutes—reaching 112 mph on one stretch, and averaging a blistering 77 mph for the entire run.

The *Zephyr* was streamlined, too, but it was diesel-powered and built of stainless steel. In retrospect, it's clear that the *Zephyr's* construction and power plant became the model for most lightweight trains to follow, but that wasn't known in 1934. After three decades of heavyweight cars attired in somber Pullman green, both of the new trains promised a different travel future—and one that would be competitive with air travel and the family automobile. In the press and among the general public, it seemed everyone was buzzing.

Determined to upstage the Burlington, Harriman conceived an event bolder still. Union Pacific's second streamliner would debut with a record coast-to-coast run—going three times farther than the *Zephyr* and experiencing changes in climate and terrain unknown on the competitor's flatland route.

Burlington may not have been Harriman's only competition: The existing coast-to-coast record was set by his father in 1906, when he went from Oakland, Calif., to New York in 71 hours 27 minutes. Though Averell was 42 and could point to impressive achievements of his own in business and finance, his father was a legend, especially at Union Pacific. Harriman *père* made record runs for sport, and the son would go him one better.

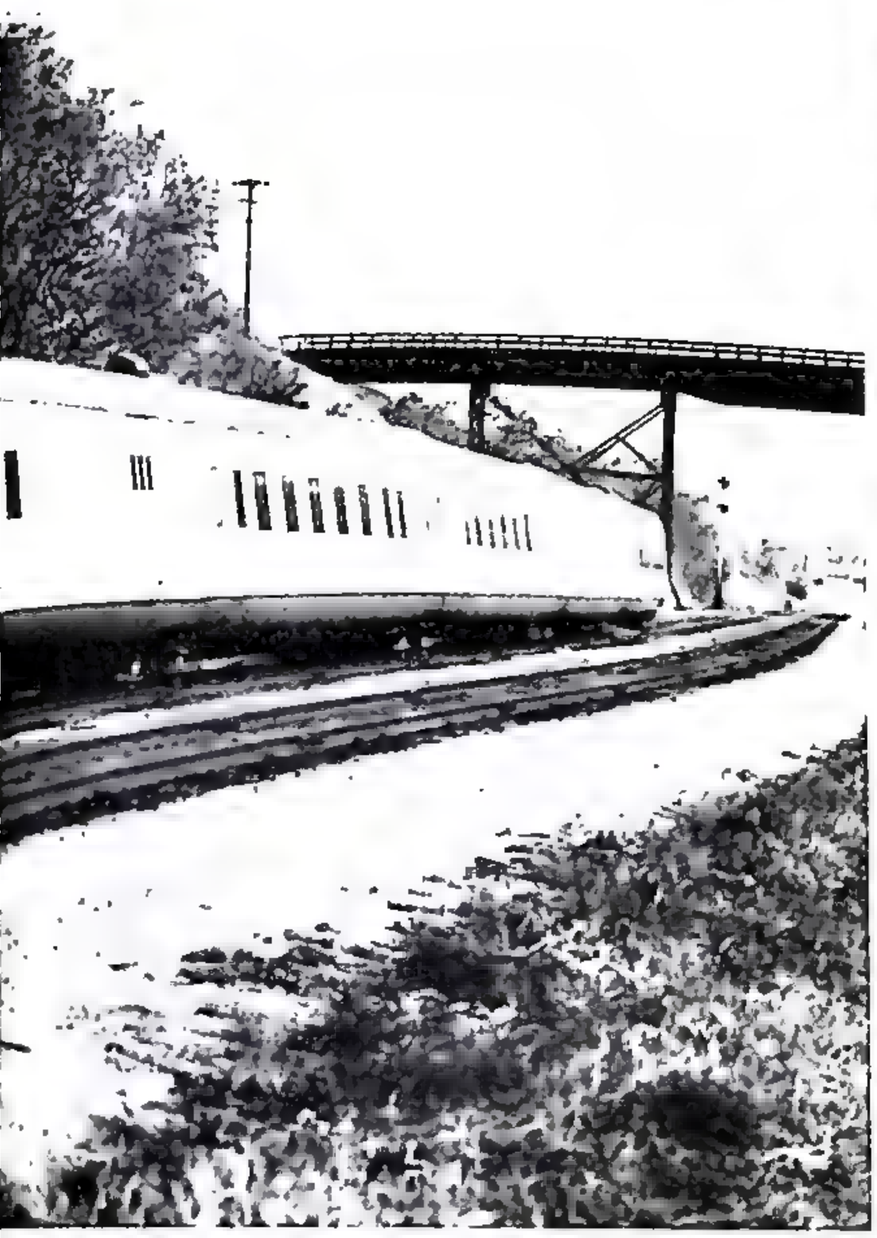
FLYING ON RAILS

In the prosperity of the 1920's, automobile ownership more than doubled, while railroad passenger-miles were cut in half. Airlines had yet to make serious inroads, but the threat was there. In 1934, it still seemed possible for railroads to win back some of this traffic, and during the remaining years before World War II, the new streamliners succeeded. Just as important, they were much less expensive to operate than steam-powered, heavyweight trains.

In much the same way as the Mercury, Gemini, and Apollo missions of the 1960's would result in putting men on the moon, Union Pacific's early streamliners were part of a planned program of several trains, each building on its predecessor and culminating in an ultimate goal. At UP, the M-10000 was intended to prove the concept of an aluminum train powered by internal combustion. The ultimate goal, fulfilled by the M-10002 and later trains, was a fleet of speedsters linking Chicago with Portland, San Francisco (Oakland), and Los Angeles.

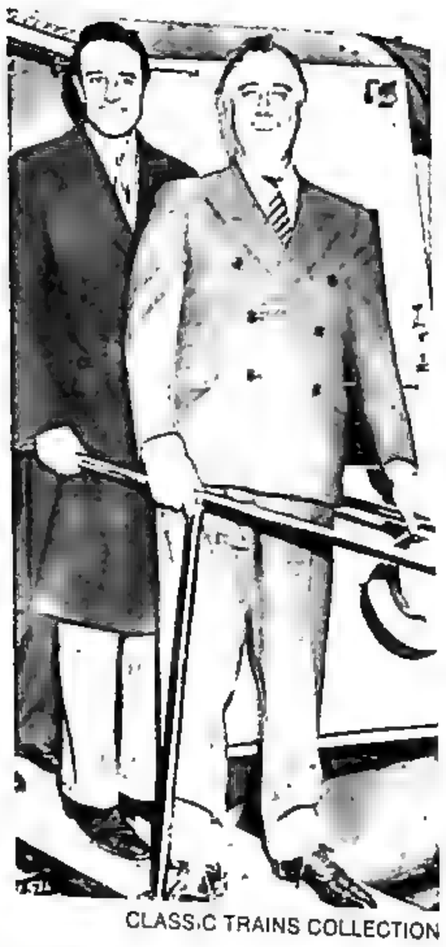
M-10001 represented an intermediate step. Its principal mission was to demonstrate that a streamliner could cut about a day from schedules between Chicago and Los Angeles. UP's fastest train on that route was carded at 58¾ hours.

The company's early streamliners borrowed heavily from aircraft design. Developed jointly by UP and Pullman, their tubular aluminum skeletons were more like airframes than conventional railroad cars. Extruded aluminum could be formed into compound curves, and the train's skin was even extended to the bottom of the carbodies, just 9½ inches above the rail, almost making for an aircraft-style fuselage. These extraordinary measures all contributed to decreased wind resistance, as demonstrated in pre-construction wind



CLASSIC TRAINS COLLECTION

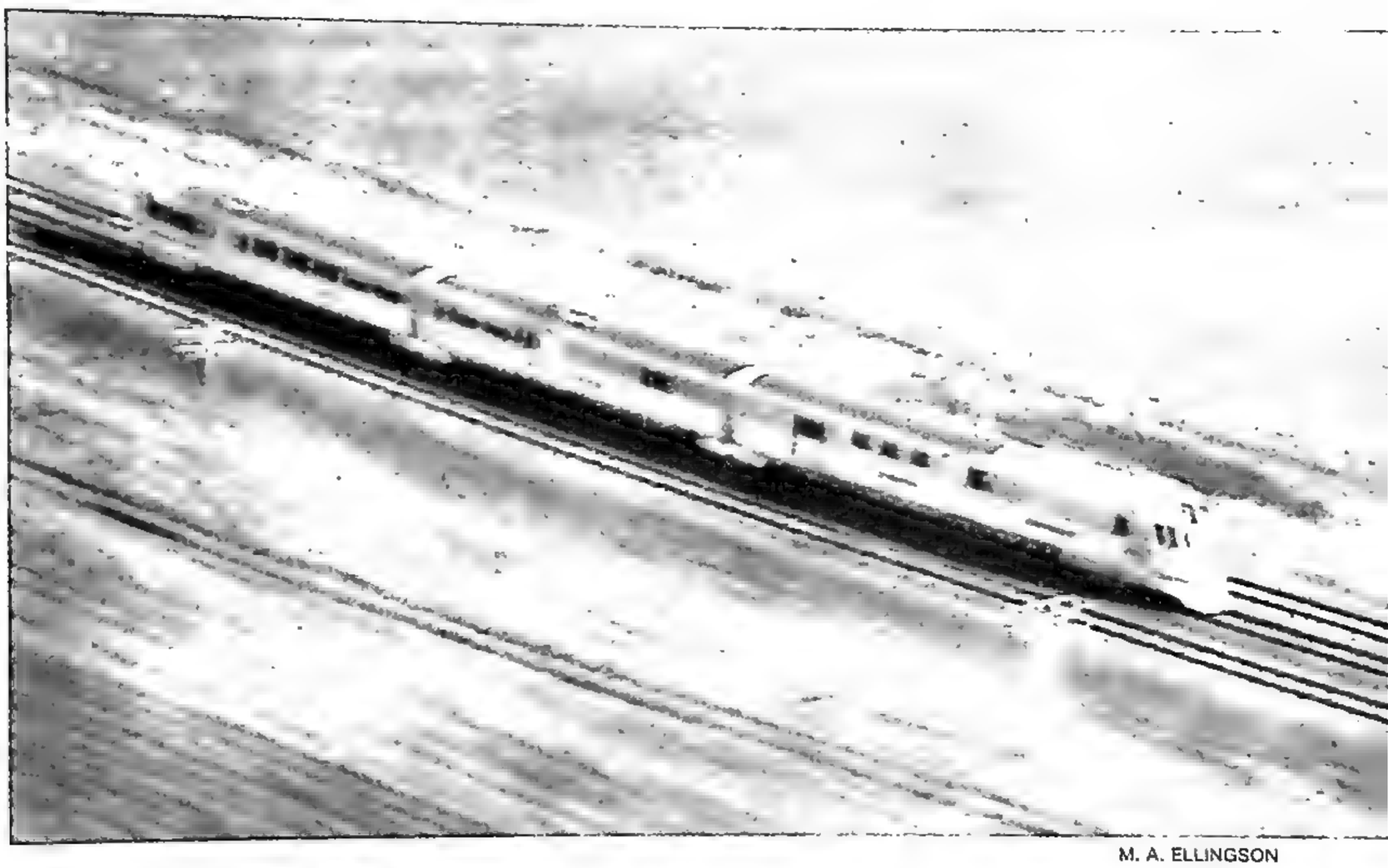
New M-10001 stands on the UP main line just west of Omaha for an official portrait. The train is in its original configuration, with 900 h.p. engine and five trailing cars.



CLASSIC TRAINS COLLECTION

RAIL PHOTO SERVICE: GERALD M. BEST

As the first streamliner, UP's M-10000 (seen at Topeka, Kans.) took the nation by storm. President Roosevelt visited the train with Averell Harriman during its cross-country tour.



M. A. ELLINGSON

The Burlington's *Zephyr* made national headlines with its sensational non-stop Denver–Chicago run on May 26, 1934, photographed from a pacing airplane in western Nebraska.

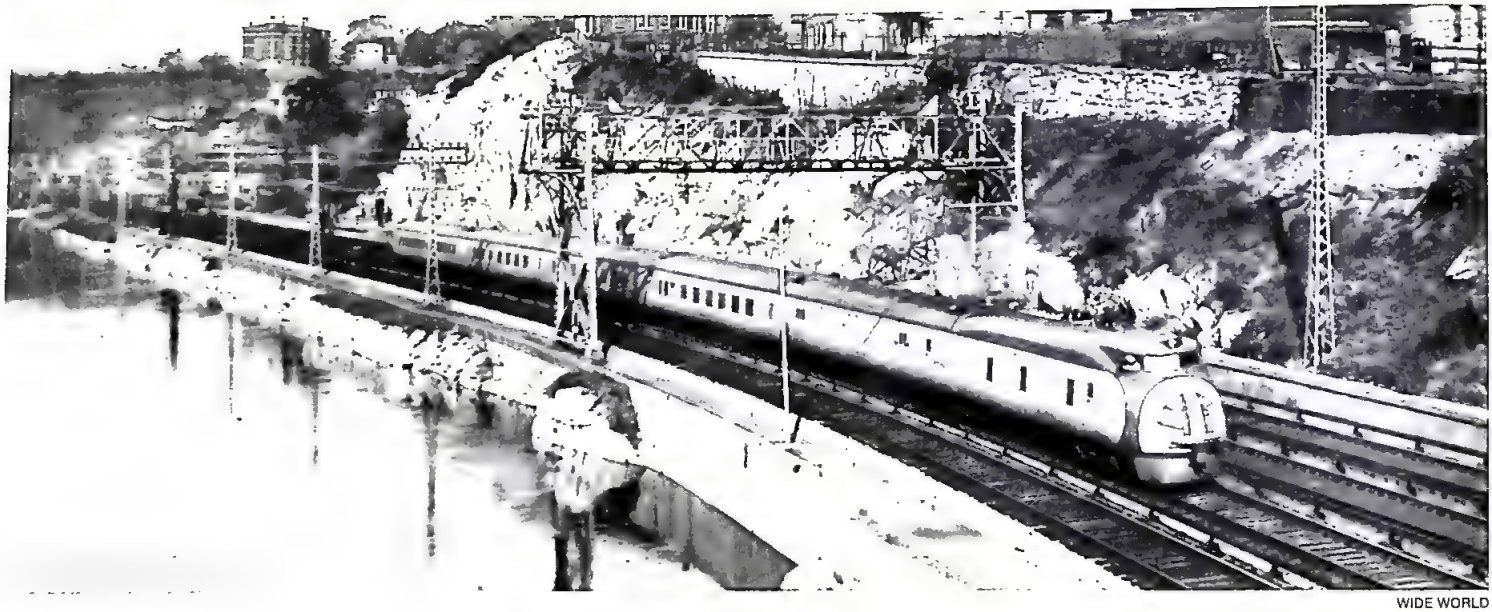
tunnel tests—another new thing in railroad applications. The entire train was articulated, with each pair of cars sharing a single, two-axle truck in order to save weight. Full-width diaphragms were installed between cars, also contributing to better aerodynamics.

Aluminum and aerodynamics weren't entirely new to American railroading, but they had never been used on such an ambitious project. Pullman began experimenting with self-propelled aluminum-skin cars in the early 1930's, and had even gone so far as to partner with the designer of the Ford Tri-Motor airplane on one project. Pullman built an aluminum sleeping car in 1933, and while it's likely that no one knew it at the time, the company had already built its last heavyweight sleeper two years earlier.

But the M-10001 differed from the M-10000 in several respects. UP mechanical personnel weren't sold on the reliability of Electro-Motive's diesel engine when they ordered Little Zip's 600 h.p. distillate prime mover, but subsequent improvements and Burlington's *Zephyr* proved that a 900 h.p. diesel was the right choice for the M-10001. And, while the M-10000 had been a three-car day train, the newer train needed sleepers for West Coast service—the first streamlined sleepers ever. M-10001 had six cars: a power car; baggage/RPO; sleepers *E. H. Harriman*, *Abraham Lincoln*, and *Oregon Trail*; and a 54-seat coach/buffet. (*E. H. Harriman* would be converted to a dining car before the train was placed in regular service in 1935, and another sleeper, *Overland Trail*, was added to the consist at the same time. This car had been displayed with M-10000 at Chicago's Century of Progress world's fair in 1934, though it was not part of Little Zip's consist on the nationwide tour.)

But why did Union Pacific commit so early, and so emphatically, to the new trains? Mostly, it was because of Harriman's interest. During the late 'teens and into the 1920's, he had invested in shipbuilding concerns and in the fledgling aviation industry. When German diesel engine manufacturers sought to sell him on their products for marine applications, Harriman listened—and then sent them to the UP, as well. While the diesel's weight-

JEFF SCHULTZ COLLECTION



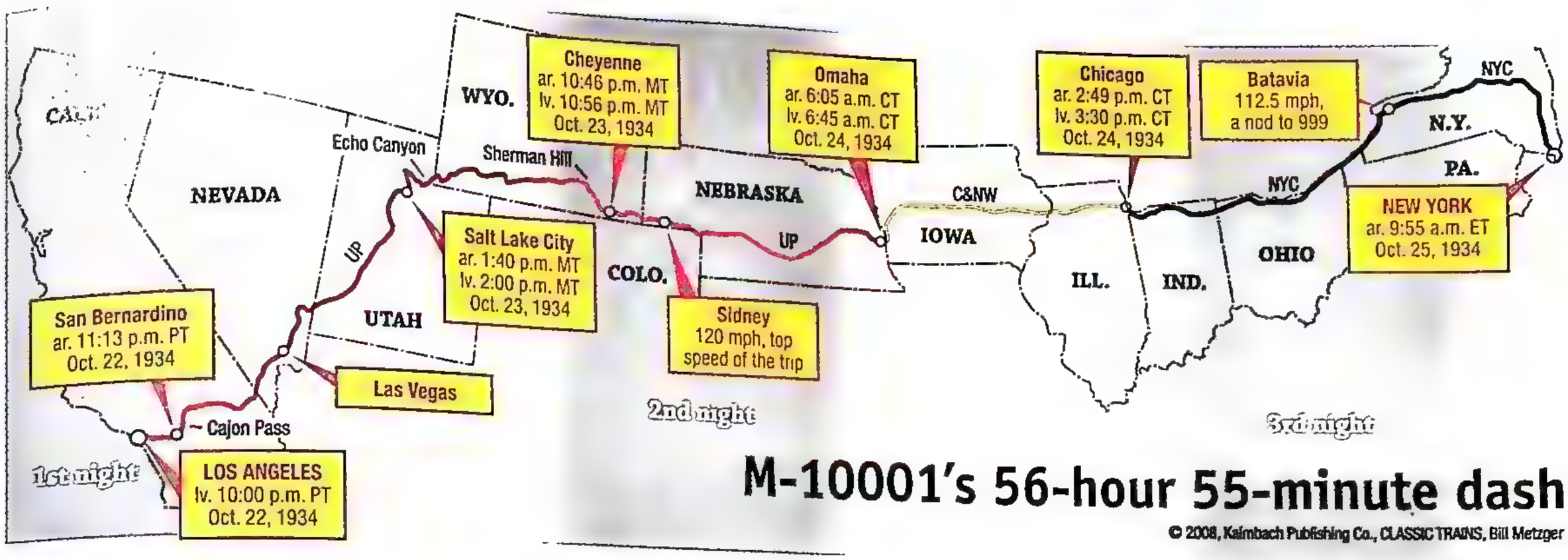
WIDE WORLD

Railroaders and others (top) pause to watch the M-10001 skim though Maywood, Ill., in suburban Chicago on the C&NW, some 38 hours into the coast-to-coast run.

The next morning, October 25 (above), finds the streamliner in New York Central third-rail territory, reeling off the last few miles of its epic dash from Los Angeles.

Its 3,254-mile journey over (left), the train stands at the finish line: the subterranean darkness of Grand Central Terminal.

CLASSIC TRAINS COLLECTION



M-10001's 56-hour 55-minute dash

© 2008, Kalmbach Publishing Co., CLASSIC TRAINS, Bill Metzger

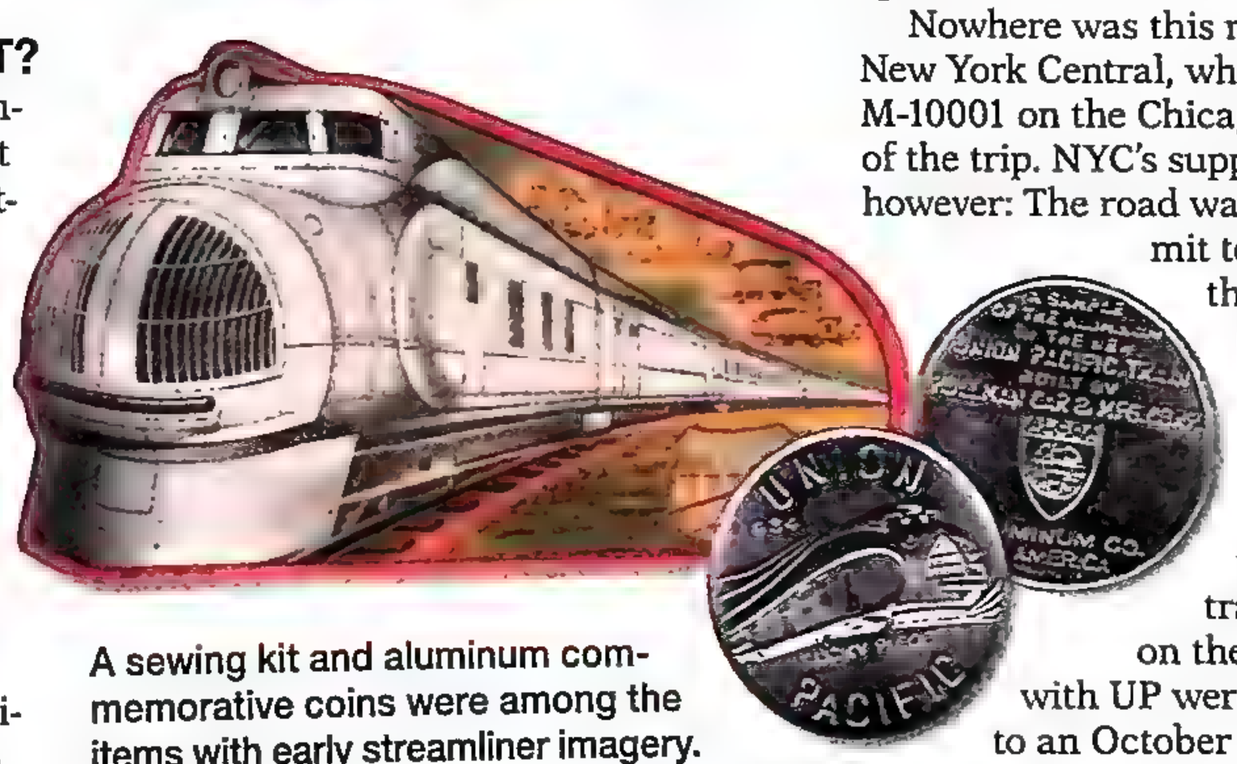
to-horsepower ratio was still far too high for railroad applications at the time, UP mechanical men stayed abreast of the developing technology. Similarly, Harriman was no stranger to aerodynamics and lightweight construction, thanks to his aviation interests. By May 1933, he was ready to announce "Tomorrow's Train Today." Little Zip went to Washington the following February, and the M-10001 was ready in October 1934.

TEST RUN OR PUBLICITY STUNT?

Thanks to a great deal of advance planning, Union Pacific was already confident that it could slash nearly a day from existing schedules between Chicago and the West Coast, even before the M-10001 got the highball in Los Angeles. So why go on to New York?

UP claimed that the run was a serious operational exercise, not a publicity stunt. In fact, it was both—and the record run was probably planned to serve both goals, right from the start. In an August 2 memo to passenger traffic manager W. S. Basinger, traffic vice president F. W. Robinson revealed "some incidental discussion about running the six-car train on an eastbound trip, possibly to include a fast run from Los Angeles to New York. This train will shortly be ready, and it will be necessary that we give prompt consideration to what can be done in this respect. It should be one for which a well-laid foundation *for publicity* [emphasis added] should be undertaken, with possibilities of including moving-picture people . . . and writers of importance. Please be turning this over in your mind."

Within a week, it seemed most of the railroad's operations and p.r. people were making plans. Public relations chief E. C. Schmidt advised Robinson on August 8 that "the first requirement for securing proper publicity is that the event shall have definite news value"—and then he went on to offer a plan with a human angle. Schmidt believed that "with Mr. W. A. Harriman riding the new train from Los Angeles to New York in an effort to break the record set by his father . . . there would be established a news angle with sufficient color and romance of the Union Pacific to interest the newspapers." In fact, that seems to have been exactly the angle Schmidt played up: During the record run, it was the rare newspaper that didn't mention Averell's attempt to break his father's mark.



A sewing kit and aluminum commemorative coins were among the items with early streamliner imagery.

Meanwhile, UP Executive Vice President William M. Jeffers was emphasizing the operational implications in his interviews with the press. Speaking to Denver's *Rocky Mountain News* on August 7, Jeffers promised that the M-10001 was "not just an experiment. We feel the heavy trains are a thing of the past . . . If this [38- to 40-hour] schedule can be accomplished, American railroads will have a place in the sun when it comes to competing with airline passenger service for speed. With the West Coast only 40 hours from Chicago, the business executive will lose only one business day on such a trip."

Jeffers made a good point: While the streamliners were the pride of the Union Pacific, the implications of the new trains extended to the entire industry. That's why other railroads supported publicity tours of the early lightweight trains. The M-10000 and the *Zephyr* had both made extensive tours away from home rails, and for the M-10001, unlike the previous trains, other roads would be asked to support an extended speed run that would affect their operations.

Nowhere was this more true than on New York Central, which would host the M-10001 on the Chicago–New York portion of the trip. NYC's support had its limits, however: The road was reluctant to commit to a faster schedule than its flagship *20th Century Limited*. Whether it was for solid operational reasons or because the Central's people wanted their own train to wear the crown on their road, negotiations with UP were cordial, according to an October 2 memo from Basinger to Robinson.

The Central supported both the operational and p.r. goals for the record attempt. Operationally, they permitted refueling at Chicago's La Salle Street Station (from a tank car on an adjacent track, since there weren't any diesel servicing facilities at the time), and UP crews would be allowed to operate the train with an NYC pilot in the cab. Central would support the p.r. effort with press events at La Salle Street and Grand Central Terminal, and also hosted an October 9 meeting at its New York headquarters to plan the tour that would follow the record run. UP wanted its newest train to visit Eastern cities that had been missed on the M-10000's tour a few months earlier, so the New York meeting included representatives from Baltimore &

CARLTON E. PARKER; KEVIN T. FARRELL COLLECTION

On November 3, 1934, nine days after its record run, the M-10001 is on exhibit at Boston's South Station, where crowds are lined up beside a Boston & Albany tank engine to tour the futuristic streamliner.

Ohio, the New Haven, and the Pennsylvania, in addition to the UP and NYC people.

Coordination may not have been as good with Chicago & North Western, UP's connection from Omaha to Chicago. In a case of the publicity outrunning the planning, C&NW's passenger traffic manager wrote to Basinger on September 23, less than a month before the record run was to start: "Every now and then we notice an article in the papers about your new stream line trains, which it is announced will be ready very soon. Are your plans about them such that you can now give us the benefit of some advance information?"

THE "FLAPPER OFFSPRING"

The planning, particularly among p.r. people, built to a frenzy in the last weeks before the October 22 departure. Schmidt had big ideas: He wanted a star from each of the eight major Hollywood studios to ride the train, and he was particularly keen to get Will Rogers and Mary Pickford, even though Ms. Pickford was past her prime. His timing was off, however: Rogers began shooting *Life Begins at Forty* the previous week, and most other stars were shooting in October, too. In the end, UP got Anita Louise, a 19-year-old starlet—and they didn't even get her until 12 hours before departure. The underage Ms. Louise was properly chaperoned by her mother.

Prominent business leaders were also on the invitation list: For a time, it looked like Walter P. Chrysler would ride, but a last-minute conflict kept him away. Electro-Motive founder H. L. Hamilton and General Motors Research chief Charles Kettering did join the train at Salt Lake City, and they rode the rest of the way to New York. A variety of UP bigwigs also rode the train, including Harriman, Jeffers, Robinson, Schmidt, Basinger, and President Carl Gray.

The Los Angeles Chamber of Commerce had its president on board, and its newsletter spoke for many local interests when it said that UP's streamliners "will be a great boon to Southern California business and agriculture . . . Under the new schedule, Southern California is as close to Chicago as are the winter resorts in Florida."

Schmidt was more successful with the press than he had been with the movie stars. Ten major newspapers had reporters on board, as did NBC radio. Even the famously dyspeptic L. D. Hotchkiss, managing editor of the *Los Angeles Times*, was impressed—but then, the *Times* was an unabashed booster of business interests in those days. Hotchkiss filed daily reports from the train, including this Page 1 dispatch from the departure scene on the night of October 22:

> The big yellow and brown train of the Union Pacific set out last night on an epochal trip with the best wishes of fully 8000 persons who learned, somehow, that the point of embarkation would be East Los Angeles, which was supposed to be a secret. [The UP was worried about curiosity seekers impeding the train's departure. The concern was well-founded: The train had to keep its speed down for the first few miles, and it was five minutes late at San Bernardino.] Her 900-horsepower Winton Diesel engine, turning over a giant General Electric generator that converts her power into electricity, hummed merrily away, with only a slight purring sound and no vibration. Huddled in a forward cockpit, much like that of a modern air liner, three engineers sat at the controls . . . Only one was needed to operate the rail-rocket, but they were all there to participate in this first history-making run.

Meanwhile, amid the smoke and colored light of several flares that lent an ethereal aspect to the proceedings, Harriman made a few remarks, repeating UP's mantra that "we are not trying to break records, but

making ... run on a schedule that we expect to ... ablish early next year, as soon as enough equipment is completed."

The *Times'* Hotchkiss took no position on that question, but he dutifully mentioned E. H. Harriman's 1906 record, just as Schmidt would have wanted. Seemingly caught up in the drama of it all, his breathless description continued:

> Grim-faced and tense, without a smile between them, the trio of engineers sat up front . . . their eyes darting from the ribbon of track ahead to their railroad watches . . . A signal from somewhere back in the depth of the yellow monster . . . sounded in the engine cab. With hardly a sound, the mass of aluminum alloy, steel, bronze, and glass began to move. With amazing swiftness, it got underway . . . It was gone before many spectators realized . . .

The train easily lifted its 52 passengers unassisted over Cajon Pass, across the Mojave Desert, and into Las Vegas, Nev., still little more than a sleepy desert watering hole. It was five minutes early at Salt Lake City—almost 6½ hours faster than UP's *Los Angeles Limited*, which the streamliner had overtaken during the night. Up through Echo Canyon, across Sherman Hill, nothing seemed to faze the new wonder machine. On time at Cheyenne, just 23 hours 45 minutes out of Los Angeles, the *Times'* Hotchkiss panted over his portable typewriter:

> Streamline, the skittish young daughter of the old iron horse, is streaking her way across the continent at a pace which causes her papa to emit loud toots, which besides conveying the customary bon voyage of the rails seem tinged with a note of wonderment and dismay, every time he catches sight of her. But all parents are that way, you know. Bearing the colors of the Union Pacific, this flapper offspring of a grand old family is out to show the world that rail travel is tired of the nose-thumbing from . . . those pesky airliners.

UP may not have cared much for the term "flapper," but it was clear that this train was one fast gal. She had already covered the 1,298 miles from East Los Angeles to Cheyenne faster than any train in history. But the next 507 miles to Omaha offered the best chance for sustained high speed on the entire run: It was mostly downhill, and it was all UP.

Six hours and 9 minutes out of Cheyenne, the streamliner stood at the banks of the Missouri River, having averaged 84 mph on the nocturnal dash. It was 6:05 a.m. in Union Pacific's hometown, and a new day was dawning. Since leaving Cheyenne, the train had covered 100 miles at 100 mph or better, including 18 miles at 110.5 mph, and 2 miles at 120 in western Nebraska. It was the fastest 500-mile run ever.

Zephyr's forgotten cousin

By at least a dozen impressive measures, the M-10001's coast-to-coast dash was a significant achievement. So why isn't it better remembered than the *Zephyr*'s Denver–Chicago non-stop run?

By October 1934, it's possible that the public and the media were already becoming sated with news of ever-faster trains. M-10001 was the *third* highly hyped train that year, after all, following M-10000 and the *Zephyr*. President Roosevelt himself had toured the first train; how could anyone top that? (UP lined up New York mayor Fiorello LaGuardia for the M-10001's arrival. He was the second-best known politician in America, and like the President, he had a way with the press; alas, he bowed out of the Grand Central festivities, pleading a budget crisis.)

M-10000 got good press because it was the first. The *Zephyr*'s hype succeeded because there was something about a dawn-to-dusk nonstop run that was easy to get one's mind around. A three-day story like the M-10001, on the other hand, is much harder to sustain. Besides, the train looked a lot like the M-10000.

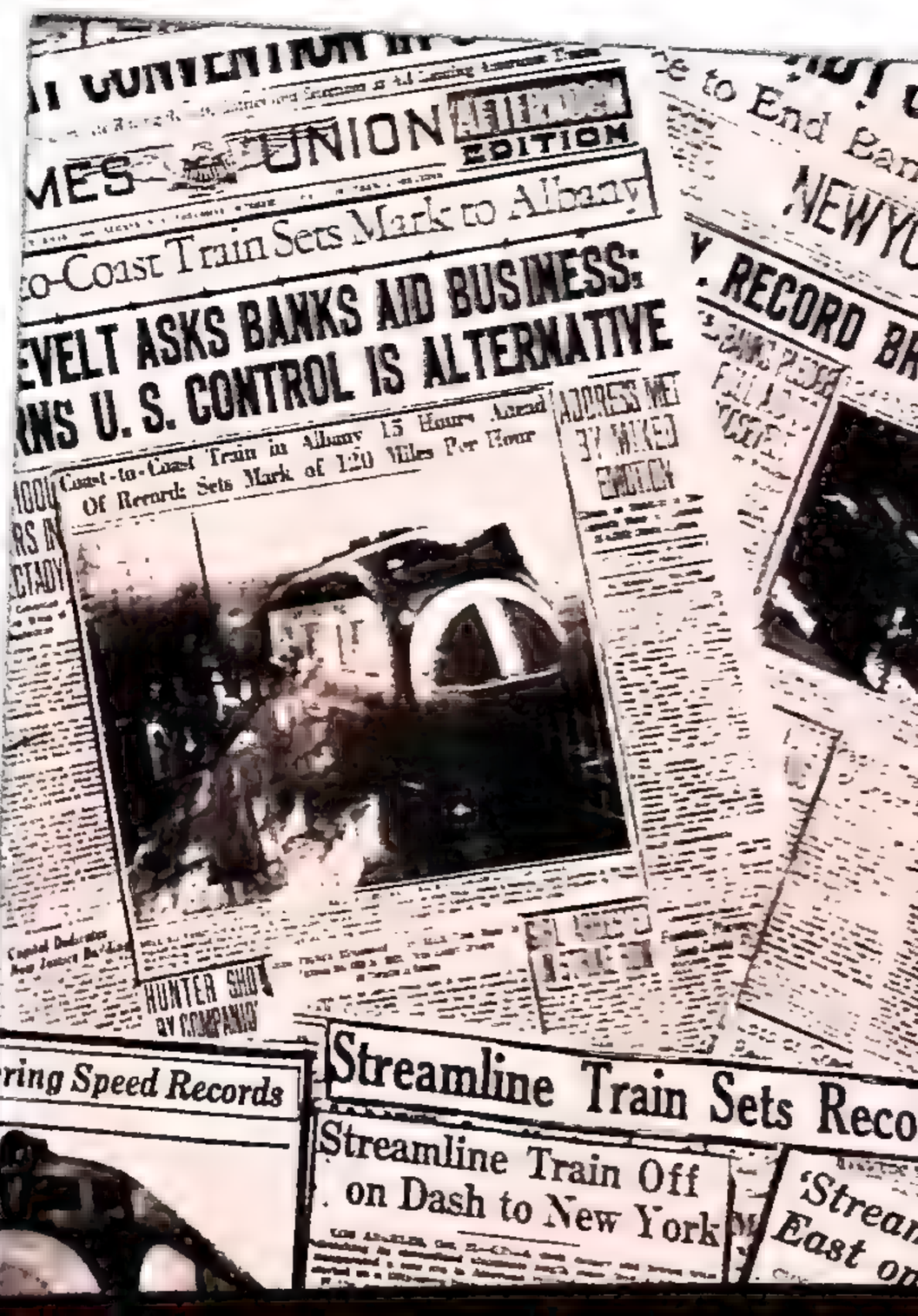
Even more significant, perhaps, were the other headlines when M-10001 set its record. Bruno Hauptmann was to be arraigned for the kidnapping of the Lindbergh baby, and Pretty Boy Floyd was hunted down and killed in rural Ohio. And, as if to remind UP what it was up against, an air race was being flown from England to Australia, and even in the U.S., it generated a lot of headlines.

As the saying goes, sometimes you're good, and sometimes you're lucky. The M-10001 was good, but fortune failed her. Today, the *Pioneer Zephyr* occupies a justly prominent place in Chicago's Museum of Science & Industry. With modifications following the coast-to-coast dash, the M-10001 served for three years as the *City of Portland*. It was scrapped in 1941, a victim of its own success: Newer and better streamliners had already made it obsolete.—*Peter A. Hansen*

BACK TO THE FUTURE

She languished in Omaha for a full 10 minutes—most crew changes on the speed run were scheduled for 60 seconds—and then it was off to Chicago on the C&NW. The yellow streak blazed across Iowa and northern Illinois. Quickly navigating the Chicago terminal district was a feat unto itself: The train left North Western's east–west main line at California Avenue, ran south and then east on C&NW via Wood Street Yard and the St. Charles Air Line to a connection with the NYC at 16th Street, and finally made a half-mile reverse move north into La Salle Street Station.

The whole exercise took about a half hour, but the M-10001 was at La Salle Street just 38 hours 49 minutes after leaving Los Angeles. The train had slashed 20 hours from the fastest regular scheduler, a 40-hour regular run to North Western Terminal in Chicago was certainly practical with the new trains.



The M-10001 captured headlines, even though its record run is today not as well remembered as the *Zephyr*'s.

M-10001's timing from Cheyenne to Chicago was about two hours longer than Burlington's *Zephyr* had taken on a slightly longer route from Denver, but the *Zephyr* was on home rails all the way. Still, UP had demolished the old Los Angeles–Chicago record of 54 hours 50 minutes, set by Death Valley Scotty's 1905 chartered train on the Santa Fe.

The run from Chicago to New York was almost an anticlimax, but not quite. People all along the route knew about it, and crowds turned up in Ohio, Pennsylvania, and upstate New York—even in the wee hours—to watch the little train streak past. In a nod to UP's New York Central hosts, the M-10001 touched—but did not exceed—112.5 mph on a two-mile stretch at Batavia, N.Y. The symbolism was understood by almost everyone on board: It was the same speed, in the same place, supposedly achieved by 4-4-0 No. 999 in 1893. (That record is widely doubted today, but it was commonly believed in 1934.) Perhaps in return, the Central relented on the schedule, allowing the streamliner to better the *20th Century*'s 17¾-hour carding by 20 minutes.

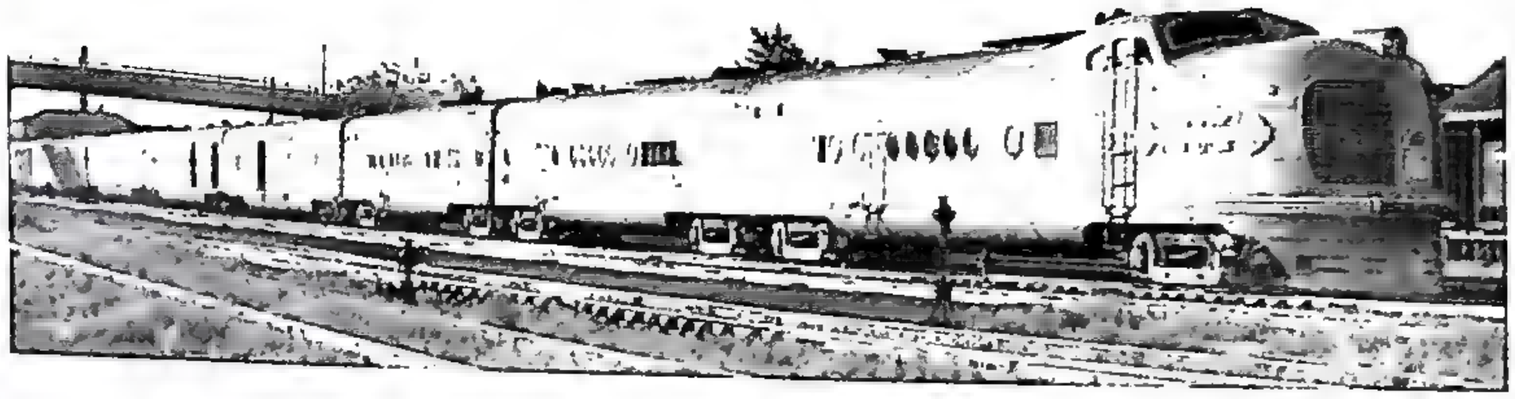
Under sunny morning skies, the little train skimmed down the east bank of the Hudson. Local law prohibited the diesel's operation into Grand Central Terminal, and so, somewhat ignominiously, a utilitarian S-1 electric was coupled to the M-10001 at Mott Haven, five miles out. Union Pacific p.r. man Schmidt was properly concerned about newsreels and still photographers showing his train being towed, but the press obliged, and no photos showing the S-motor are known to have been published.

The train's 9:55 a.m. arrival was greeted by a crush of reporters, photographers, public officials, business leaders, and curiosity seekers. New York Central, a class act to the last, rolled out the *20th Century*'s red carpet for the arriving passengers, led by Averell Harriman. Following him were

CLASSIC TRAINS COLLECTION

After its speed run, M-10001 received a new pilot, longer power car with 1,200 h.p. engine, and a sixth passenger car. The revised train rests at North Western Terminal, Chicago, while in *City of Portland* service.

RAIL PHOTO SERVICE GERALD M. BEST



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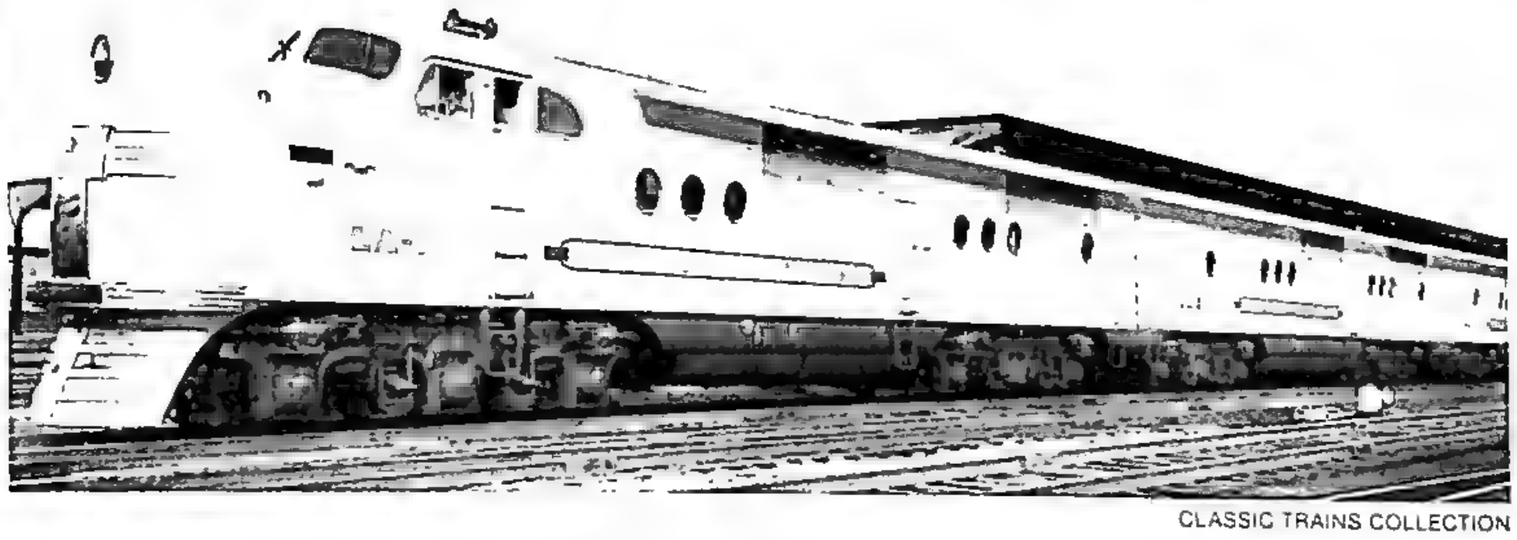


CLASSIC TRAINS COLLECTION

Streamliner evolution: UP M-10002 (top, at Los Angeles, 1936) continued the M-10000/ M-10001 styling, but had two power cars, which were coupled to—not articulated with —its train. Nos. M-10003–M-10006 (represented by the '05, center, at North Platte) had automobile-style cabs and, like the '02, were seperable from their trains. The slightly bulbous noses of 1937-built Nos. LA-1 (above) and SF-1 recalled the later M-series styling, but otherwise they were conventional Electro-Motive E units, designated model E2.

Pullman CEO D. A. Crawford, who had boarded in Chicago, and GM's Kettering and Hamilton. General Electric CEO Gerard Swope hadn't ridden the train, but he joined the arrival ceremonies.

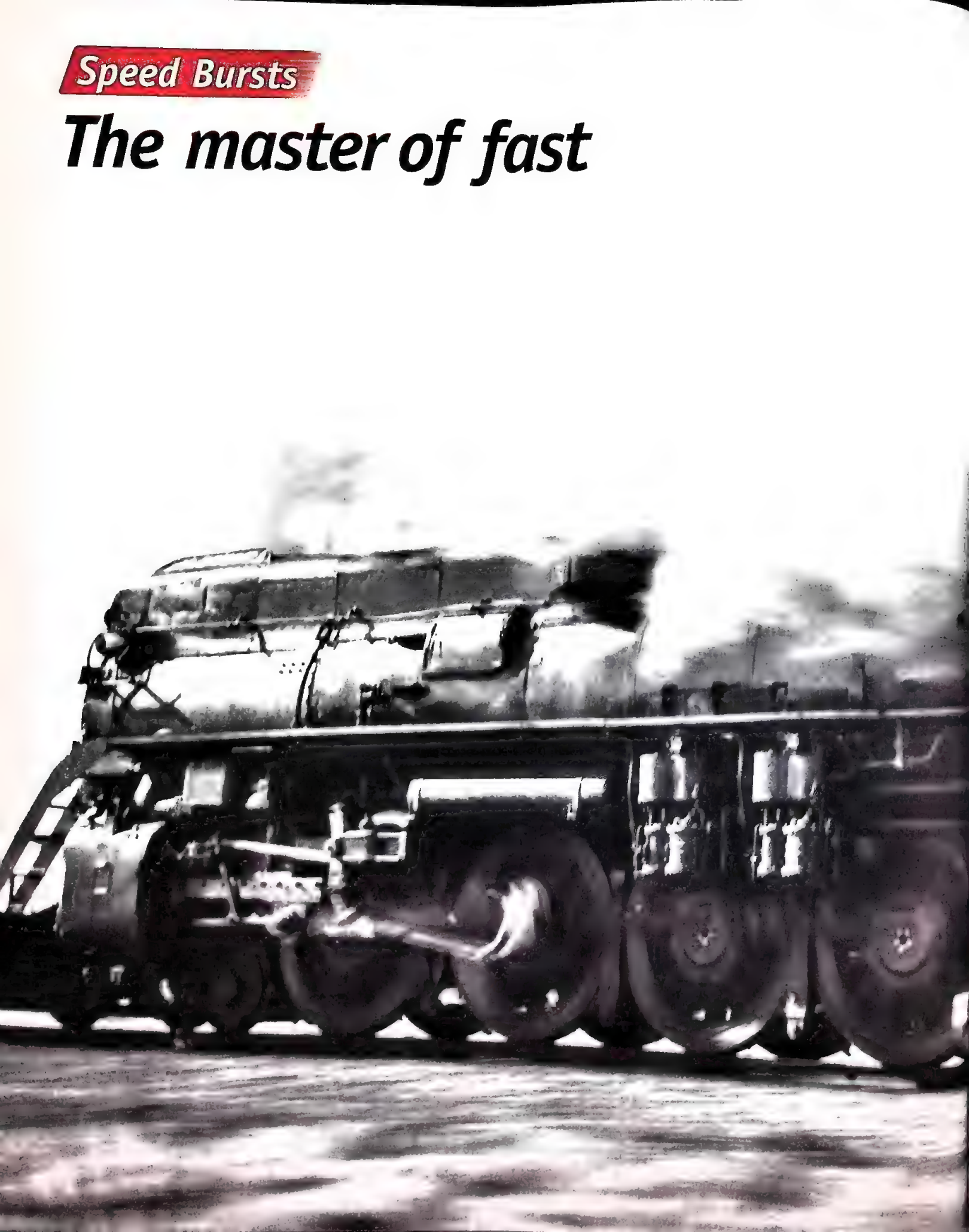
The machine their companies built had met or exceeded all expectations: Not only had the M-10001 set several speed records, it proved highly economical in the process. Pullman Vice President E. E. Adams noted that, "A conventional steam train of the same capacity as this streamliner would require 3000 horsepower, where we use 900 horsepower. Eighty per cent of this saving at 90 miles an hour on level tracks can be credited to the aerodynamic design. On upgrades, a larger portion of the saving is due to light weight." UP's Jeffers estimated the operating costs were 40 to 50 percent of a comparable steam train. The diesel got 1.6 miles per gallon over the entire run, consuming just $80 worth of fuel from coast to coast.

In the mid-1930's, it was still possible to believe that the combined efforts of UP, EMC, GE, and Pullman could save passenger railroading. All of them indeed made significant railroading contributions in the ensuing years, but at least in the passenger business, the triumph was fleeting. The passenger train was up against too much—from policymakers, deep-pocketed highway interests (including Electro-Motive parent General Motors), and a widespread personal preference for the private automobile.

Seventy-five years later, America may finally be learning the limits of automotive and air transportation. There could yet be a resurgence of rail travel, but to this day, no other passenger train has gone from coast to coast in less than 56 hours 55 minutes. ■

Speed Bursts

The master of fast



Robert Hale had few peers in the art of photographing trains at speed. Typical of his work is this view of Southern Pacific GS-3 4-8-4 No. 4421 racing down the San Joaquin Valley near Brentwood, Calif., with train 52, the Oakland–Los Angeles *San Joaquin Daylight*. Although the GS's had lost their colorful *Daylight* styling by this time, they wrote some of the final chapters of high-speed steam operations on these runs in the mid-1950's.

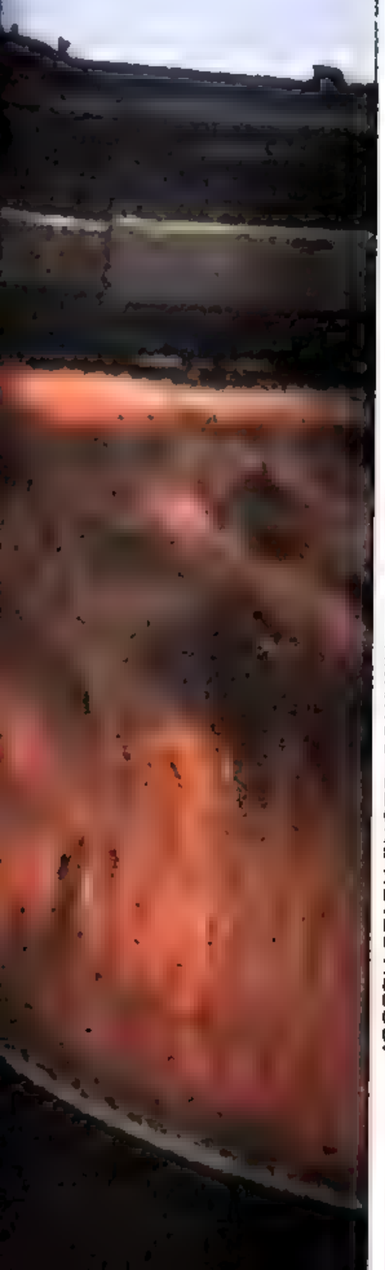
North Coast Limited vs. Hotshot 60[illegible]

WHO GETS TO FARGO FIRST?

Freight 600 was vying with NP 25, which—11 hours later, and in darkness—would look much like this *Mainstreeter* exiting the Valley City "High Bridge" in September '64.

MATTHEW J. HERSON PHOTO, COURTESY BILL KUEBLER

Substituting here for eastbound hotshot 600 in the nocturnal "race" is a westbound near Cyr, Mont., on October 3, 1967, with the same type of diesel consist: an SD45 and two U25C's, then NP's top-of-line power.



JOSEPH STARK PHOTO, COURTESY AUDIO-VISUAL DESIGNS

A fast nighttime ride on NP 600's caboose shows that long, flat tangents can still make for exciting railroading

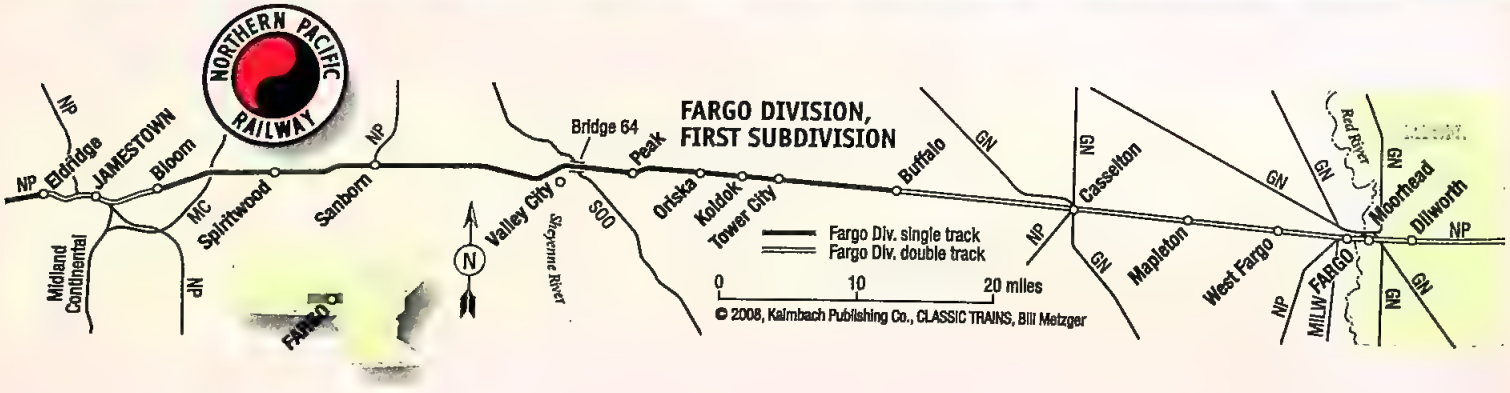
BY **BILL KUEBLER**

Races have involved almost every type of transportation vehicle known to man, from bicycles to airplanes. Train races, however, are less common. Even so, a "race" of sorts occurred on the Northern Pacific at least once, involving a freight train versus NP's crack domeliner, the *North Coast Limited*. It took place in summer 1967, and it was very exciting, at least to me, a wide-eyed 10-year-old who had a grandstand seat in the cupola of the freight train's caboose.

At that time, NP's hottest eastbound manifest freight, No. 600, often would leave Jamestown, N.Dak., in late evening. Even though it ran as an extra, enginemen, trainmen, and dispatchers were expected to handle it expeditiously, and it usually was given rights over opposing extras in single-track territory. The Mechanical Department provided plenty of power for it, too, typically three six-axle, high-horsepower second-generation units, more than enough power for a train limited to a maximum of 4,000 tons. As I recall, we had 67 cars that night, most of them loads.

Our "racetrack" was the First Subdivision of Northern Pacific's Fargo Division, which extended from Dilworth, Minn. (just east of Moorhead, on the Red River opposite Fargo, N.Dak.), 96.5 miles west to Jamestown. Dilworth was in double-track territory, oddly at Milepost 3.2 because the original division point at Milepost 0 never developed into a railroad facility. Fargo, Milepost 7.6, had the division headquarters near the passenger station, and double track extended through the city out to Buffalo, MP 44. From there, the main line was single track to Bloom (MP 95), then double track again to Jamestown (MP 99.7) and beyond.

For No. 600, if all went well and it was given rights over opposing extras between



Bloom and Buffalo, as usual, it would pass through Fargo around midnight, close to the time of the westbound *North Coast*, train No. 25. But because the Fargo depot was on the south side of the tracks, No. 600 would take a delay if 25 got there first. According to rule, for obvious safety reasons trains could not pass the depot on the eastward main if a passenger train was on the westward main doing station work. Hence, "chain gang" (freight pool) crews going home to Dilworth understood that their approaching eastbound freight would have to stop and wait near 13th Street, a few blocks west of the depot, until the passenger train left—unless they beat the *North Coast* to Fargo.

Thus was the stage set for our "race" on this warm summer night in 1967. It would prove to be a major effort by our engineer.

JOSEPH STARK PHOTO, COURTESY AUDIO-VISUAL DESIGNS

Doing the maximum allowed 35 mph, the westbound *Mainstreeter* rolls across the Valley City "High Bridge" in 1964. Built in 1908, it's 3,740 feet long and 154 feet high.

GENTS, START YOUR TRAINS

What was I, a 10-year-old kid, doing on a hot freight train? A close friend and neighbor, Gregory Belland, was an NP trainman. He was also my "tutor" in railroading, treating me like his own son and showing me the ropes (he got me to the point where I could pass a rules exam by age 12).

Belland had marked up as conductor on the extra board, and one afternoon, when he was called for westbound hotshot 603, he telephoned me and said he "needed me on the crew." Needless to say, he didn't have to twist my arm! Although I was but a lad, Belland saw this as another opportunity to teach me more about railroading, my favorite subject. During the late 1960's, I made dozens of trips with him, accumulating countless NP memories in the process. Our trip west on 603 that afternoon was fast but otherwise uneventful.

At Jamestown, we got lucky. We arrived shortly before 6 p.m. and were third out, with two chain-gang crews ahead of us to return to Dilworth, but the lineup promised a short layover. An eastbound—604, as I recall—was ready to depart as we arrived. So there went the first crew, making us second out. Our luck continued, for we learned that the crew ahead of us would get stuck with a dreaded drag known as "the 700." Instead of its usual late-evening departure, today it would leave not far behind 604. This meant that we ended up catching hotshot 600.

Although the 700 left Jamestown ahead of us by a good 3 hours with conductor Bob Robideau and crew, they needed those 3 hours lead on us or we could have ended up running on his yellow signals for dozens of miles. Ours was a very hot train; his was cold as ice.

For power, we had SD45 3610 in the lead with two U25C's trailing. On the chain-gang trips I usually rode the engine, but this time I rode with Belland in the caboose. The engineer, whom we'll call "Larry Jones" to protect the guilty, must have known when he pulled us out of Jamestown and up the hill to Bloom that it would be a "race" to Fargo, an arrival close to that of No. 25. I can just picture him looking back and forth between timetable and watch.

We left Jamestown shortly after 10 p.m., and probably hadn't gone far before Belland, and no doubt our engineer as well, figured we might reach Fargo about the same time No. 25 would—or maybe a few minutes ahead of it if we could get a roll on our cars.

"A few minutes ahead of" meant a lot in terms of our arrival time in Dilworth. If No. 25 got to Fargo about the same time we did, we'd get held near 13th Street (MP 8) for 10 or 15 minutes. To our engineer, this was a big deal. Perhaps he saw it as a challenge, the kind that "real men" take on. With only a running order in hand, we owned the main all the way to Buffalo, and the eastward main on to Dilworth. Yes, the stage was set. The race was on, and our eastbound hotshot was racing a westbound domeliner for the depot platform at Fargo.

Permit a word about fast freights passing through Fargo. The city was in yard limits, where rules required extras to move at "restricted speed," able to stop short of anything and not to exceed 15 mph. Fargo Division Special Instructions, however, contained this rather interesting language: "At Fargo . . . trains shall be operated at a reasonable speed and with due care."

Reasonable? Any good lawyer will tell you that "reasonable" means everything—and nothing. Due care? To some enginemen, that simply meant to make sure the bell was ringing (horn-blowing in downtown Fargo was prohibited except in emergencies). Thus, a fast eastbound freight usually passed through town at about 35 to 40 mph, rocking and rolling its way to Dilworth, 4 miles to the east. That was home for the crews, and most were anxious to get there.

ACROSS THE MILES

But Fargo was still more than 90 miles ahead as we accelerated up the hill out of Jamestown. Our 3,800 tons were no

J. DAVID INGLES

Caboose 1065, pictured in Duluth in July 1961, is a sister to 1058 that author Kuebler rode on No. 600. NP's Brainerd (Minn.) Shops built 50 of them, 1050-1099, in 1954.

match for 8,600 horsepower put out by 52 turbocharged cylinders. We accelerated to 60 mph just in time to slow down for the double-track switch at Bloom, which we trailed through to single-track territory.

Jones whipped our 1050-series caboose (No. 1058, if I recall right) through that No. 20 turnout at what must have been a good 50 mph. The switch was rated for 40, though NP's interlocking signal rules slapped a 30-mph limit on it. Belland knew it was coming, so he hollered at me to grab onto the bar. As small and light as I was, I nearly flew out of my cupola seat. Engineer Jones meant business!

I can still see the whitish-yellow sparks pouring out of all three units' exhaust stacks 60-some cars ahead. The reverse curves west of Spiritwood provided an especially good view of our train under a moonlit, starry sky. And that slack! *Bam! Bam! . . . Ka-bam!* After a few run-ins and -outs, Belland tried to get me to lie down on one of the lower bunks, with my feet against a forward bulkhead. He was worried, seeing my life—and his job—passing before his eyes. I wanted to keep my perch upstairs, though, and convinced him I'd be all right, as I'd managed to handle all the mayhem thus far.

Belland had his own problems, anyway. I don't recall him doing any paperwork at his desk that night. Why try that on this carnival ride? Even the brakeman across the cupola from me seemed to have a white face, but he said nothing. He just sat there, watching the train, then me, then the train. My ignorance of the possibilities must have simultaneously kept him worried and me from being scared.

The speed limit on the Valley City "high bridge" was 35 mph. Right! I think we got those digits reversed somehow. Maybe it was my imagination, but the rumble as we crossed the viaduct seemed louder and higher in pitch than usual. It was, and still is, the most spectacular structure on the division. Officially Bridge 64, stretching from MP 64.4 to 65.2, the single-track structure (designed for double track, never installed) spans the Sheyenne River valley on the north side of the town of Valley City. Completed in May 1908, it's 3,740 feet long and 154 feet above the river and the Soo Line (now Canadian Pacific) Minneapolis–Portal (N.Dak.) main line.

Perhaps my funniest memory of that night is a ubiquitous cloud of dust that followed us. It was visible against the moonlight and the occasional streetlights of the small towns. If nothing else, I sure tasted that dust cloud. It tasted like metal, ballast, and dirt, all combined in some weird gaseous concoction. The cloud, wrapped loosely around our caboose and the cars ahead, traveled with us all the way from Jamestown to Fargo, reminding me of the character Pig Pen in the "Peanuts" cartoon strip. Every time we'd smack a grade crossing with a *whumpf*, this moving cloud momentarily got bigger. The dust would mushroom, then gradually reduce back down to its usual wrap-around-the-train dimension.

Belland did manage to time a mile here and there. After one of these, he said something like, "Good grief, we're still doing a good 70." At one point, he muttered something about engineers defeating speed governors and ignoring posted limits. He didn't mention our engineer by name, however. In fact, I never heard anything bad about the man's train-handling from any train crews. On the contrary, some have commented favorably to me about his abilities. Even so, this night's ride was rougher than usual, and maybe it illustrated that some fast, efficient railroading is possible even when a speed limit is fudged a bit, as long as the crew maintains a safe operation.

Today I'd swear on a stack of *Tell Tales* (NP's official safety magazine, named for the old height-restriction alerter ropes hung above the track) that Jones had an open throttle going *down* Oriska hill. This is doubtful, but it seemed like he did, and most of us know a train's speed always seems faster after dark. We slammed through the siding switches at Koldok and Tower City in an explosion of sound. The weather was clear, and the temperature pleasant, so my cupola window was open a few inches. The flashers on the highway crossings streaked past our caboose, sounding in Doppler effect just like they do in the movies, pitch and volume simultaneously rising and then falling.

The double-track turnout at Buffalo was a repeat of Bloom—the caboose was Jones' whip, and he cracked it! By now, realizing that I might survive the ride, even Belland and his rear brakeman were "getting into the race," peeking at their employee timetables and then their watches. Nobody had to say anything. We all knew it would be close, real close.

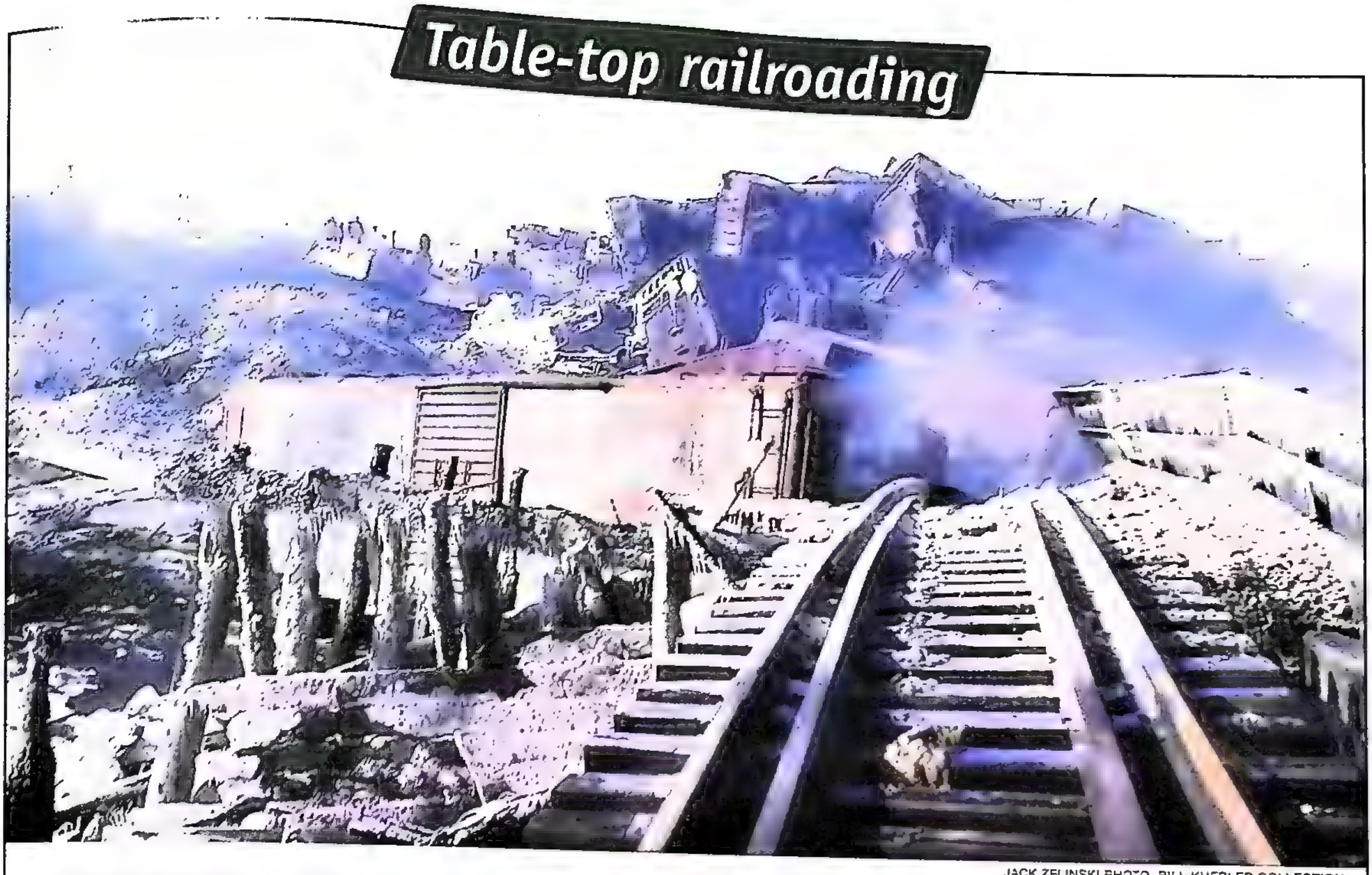
No doubt Belland pondered just how much Jones might crowd No. 25's time at Fargo and what action, if any, he as conductor should take if safety or rule compliance were in jeopardy. What if it would be a tie? We had better be prepared to stop . . . or if not, we better get on through and not delay the *North Coast*'s station work. What about a radio call to No. 25's crew? Could we trust the engineer to give us his exact location? Belland gave me the impression that the engineer on 25 that night, Francis "Fats" Magloughlin, was not known for precision when telling other crews his location. Between the timetable and our crew's watches, it didn't look good for us.

LAST LAP INTO FARGO

Now we were approaching Casselton, about 20 miles west of Fargo. The 40-mph speed limit through town was but a passing note in the Special Instructions, hardly a reality in tonight's operation. The explosive clatter of the Great Northern diamond under our caboose was exceptionally loud. About this time, Belland expressed doubt that we'd make it, and the diminutive conductor—he weighed all of 120 pounds—finally exposed his thoughts on the radio. "Caboose to Engineer Extra 3610 East; think we'll stop back of 8th Street, then?"

No answer. Seconds turned into minutes. Belland quipped that it was the longest period of silence in the history of railroading. The engineer had heard Belland, all right, he just didn't want to commit himself on the radio. An invisible checkered flag, not far ahead, seemed to

Table-top railroading



JACK ZELINSKI PHOTO, BILL KUEBLER COLLECTION

Derailment statistics for NP's Fargo Division revealed that a long piece of tangent railroad can breed more accidents than a twisty mountain grade. An overheated journal box caused this February 1965 spill of train 602 on the Maple River bridge at Mapleton, piling up a possible record 64 cars! On impact, a tank car of hydrogen peroxide exploded, destroying the structure.

Yes, much of southeastern North Dakota is table-top flat, but the First Subdivision of Northern Pacific's Fargo Division, despite being some of the straightest and flattest track in American railroading, confounds expectations by being rather interesting territory.

Westbound trains encountered no curves whatsoever all the way from Fargo to a mile east of Peak, a 50.7-mile tangent. Eastbounds on that segment had only to negotiate the double-track turnout at Buffalo. Crews believed this to be the second-longest stretch of tangent track in the U.S. (behind Seaboard's line to Wilmington, N.C., at 78.86 miles), although a list in May 1996 TRAINS of the top 10 tangents in the U.S. put this NP segment in ninth place.

Moreover, the easternmost quarter of the First Subdivision is perfectly *level*. The prairie surrounding Fargo is so flat that, other than rivers and streams, the largest change of natural surface elevation in a 400-square mile area is less than one footl Floods in the Red River valley in recent times have proved that—the excess water has nowhere to go.

For westward trains, the first gradient of any consequence was a "whopping" 0.18 percent ascent that began at MP 32. The only hill worthy of that noun was Oriska, which ascended at 1 percent westward from MP 56 to MP 59. Oriska itself was at MP 55. It is rare for any railroad to have level grade for such distances as these, but this incredibly flat Red River valley has fertile soil as black as night that supports bumper grain crops. Train crews probably could spot a car just about anywhere without tying it down, and it wouldn't roll. They tied them down anyway, of course—strong northwest winds once rolled a loose boxcar out of a siding and right into the face of the westbound *North Coast Limited*, which smacked into the empty car at 75 mph and sent it flying like a Frisbee.

"So, that car got past the derail somehow and wasn't clear of the main track, then?" I once asked 25's Engineer, Fred J. "Fritz" Lewis.

"No, she wasn't clear, but she sure as hell cleared when we hit her," he replied without missing a beat.

That little mishap was unique. As for freight-train derailments, though, a straight, flat railroad like this produced more of them. This may seem counterintuitive, but it's true: Straight and level track actually posed a safety problem. Railroads like to reduce or eliminate curves, for obvious reasons. But curves also afforded crews opportunities to look over their train and spot hotboxes or dragging equipment before it was too late. Long, tangent track pretty much eliminated this check, and the Fargo Division's derailment statistics reflected this, especially during the years when most cars had friction bearings. The Fargo Division, with all but 2 of its (only) 19 curves on the west end between the Valley City High Bridge and Jamestown, suffered more derailments per freight-train-mile than any other on the NP.

Owing to the typically high speeds involved, some of the derailments were quite spectacular. In February 1965, 602's train piled up 64 cars in Mapleton (above), believed at the time to be the record high number involved in a single train derailment.

I still can't help wondering today whether on that memorable 1967 night ride, conductor Belland thought about that 64-car pileup at Mapleton, which had happened only two years earlier. I'll bet he did.

All things considered, if ever there was a railroad "racetrack," this was it.—*Bill Kuebler*

TWO PHOTOS, DUANE DURR

Just as with author Kuebler's night ride on NP 600, Extra 6018D East (with SD45's 3602-3603 on their first eastbound run) had to cool its heels on July 13, 1966, while a westbound passenger train, in this case the *Mainstreeter*, made its Fargo station stop.

beckon us on without the slightest reduction in speed. Now Belland was beginning to second-guess himself. Perhaps we might make it? Fargo depot was about midway between Mileposts 7 and 8. We rocketed through the village of West Fargo, at Milepost 13. Tension was high. As we approached the Williams Brothers Pipeline and tank farm, we were now well within easy radio range of engineer Magloughlin on No. 25. Suddenly, our engineer called him. I can't say that his voice betrayed desperation, but he sure didn't have time for radio formalities like Belland had used.

"Twenty-Five, where are you? This is the 600, and I just passed Milepost 12. Are you by Moorhead Junction [MP 6.0]?" Magloughlin's answer was unintelligible to us, because it was drowned out by his Nathan P-3 air chime blowing for a grade crossing—the melodious sound of that A-major chord came blasting over the radio. But which grade crossing? We all wanted to know. Then, the St. Paul Division conductor on No. 25 (passenger-train crews changed at Fargo, while the engine crews changed at Dilworth) chimed in with a reply that seemed to say, "Don't even try it, fellas." I cannot recall his exact words, but that was the lasting impression.

AND THE WINNER IS . . .

No. 25. We'd made a valiant effort, and if we'd kept our speed right up at 65 or better all the way to the Fargo depot, we could have done it. But nobody, certainly not our engineer, was foolish enough to try that. It just wasn't in the cards.

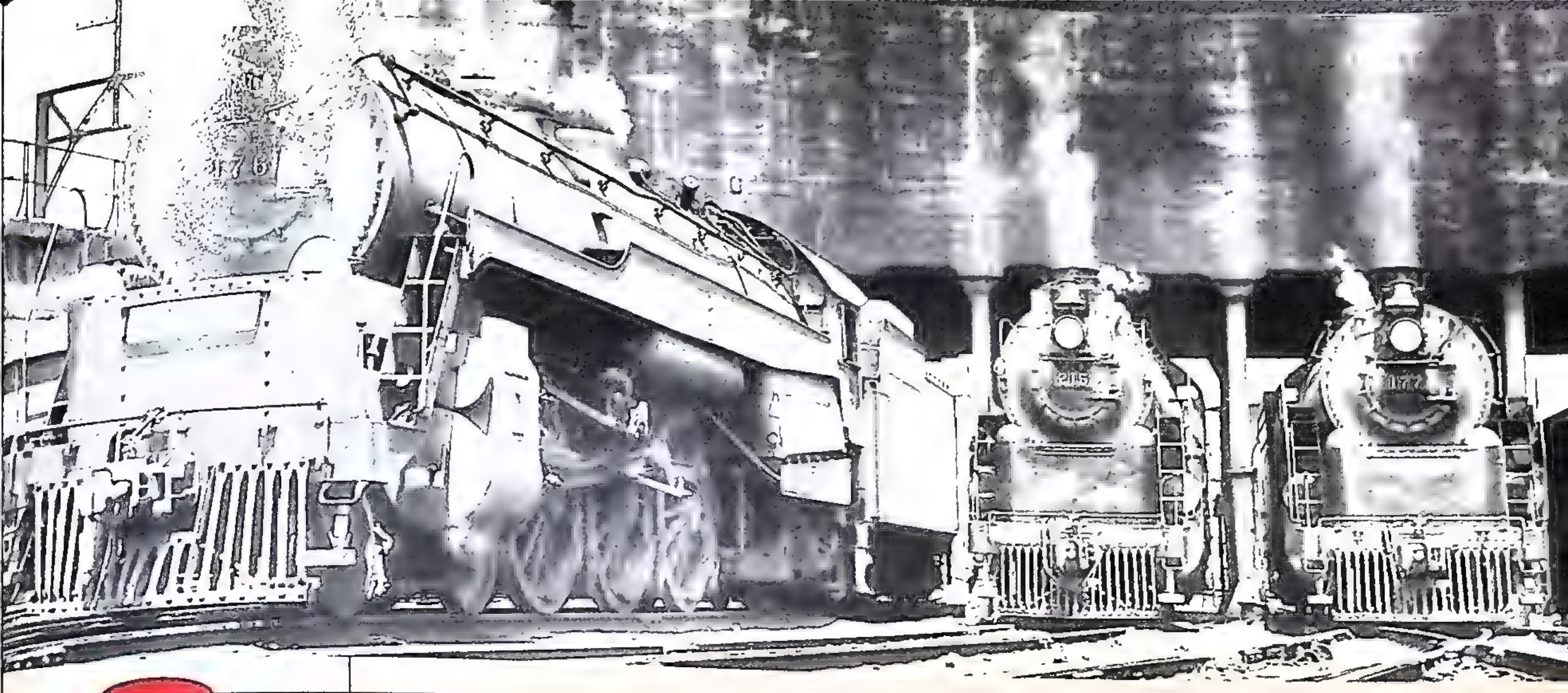
Again, it might be my imagination, but perhaps our engineer's anger was felt in our caboose when he set the air. The slack ran in as rough as it had at any other time on the trip. We came to a screeching halt with the 3610 about 20 car-lengths west of 8th Street, staring down the headlight on F9 6701A, as the *North Coast Limited* approached the depot. Had we kept going, at the worst we'd have held up No. 25's station work by however long it would've taken us to roll the rear half of our train by the depot. Instead, we sat and cooled our brakes and wheels.

The tension in the caboose subsided quickly. It is hard to say how much, if any, disappointment there was among the trainmen. As for our engineer, no doubt the wind was gone from his sails. Belland said something like, "I don't even want to see that hogger when we get to Dilworth. He will be mad as hell." And that cloud of dust just hung there, lingering, hovering 'round us as if to mock us.

So, a trio of first-generation F units had beaten our big, modern freight power. There was a consolation prize, but only for me. The left cupola seat provided a perfect perch from which to observe through a wide-open window, some 10 minutes later, the victor accelerate his train past us in a typical F-unit symphony. Maglaughlin had his three-unit locomotive in the last notch as it roared by my window. The two-tone green, 13-car domeliner clicked past, and in seconds, No. 25 became but a dim pair of red markers racing west to a "thousand miles of mountains." Well, OK . . . first, there would be a few miles of prairie and tangent track to cover.

As for our defeated 600, we slowly trundled over to Dilworth with our tail between our legs. We were in no hurry now. Quite the opposite, in fact. It was as if we didn't want anyone to know we'd just lost the race. We went much slower than usual on over through Moorhead and out to Dilworth. We had no refrigerated boxcars that needed icing, so the yardmaster directed us to pull down the eastbound main to the yard office for the crew change.

Even though I was but a wide-eyed 10-year-old, I will never forget that night. My best recollection is that our running time was 2 hours 5 minutes, including a 12-minute delay at Fargo waiting for No. 25. Its eastbound counterpart, No. 26, was scheduled across the subdivision in 1 hour 50 minutes, with only a 5-minute stop at Fargo. So, we had almost maintained passenger-train speed! Gregory Belland passed away from emphysema in 1971 at age 53, while engineer "Larry Jones," now in his 80's, still is enjoying his retirement, and we maintain contact. ■



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A8BK5K

Speed Bursts

Speedways to the sunshine

Florida East Coast billed itself as the "Speedway to the Sunshine," but it wasn't the only road with a claim to fast service to the warmth of south Florida. The other big players in the East were Atlantic Coast Line and Seaboard Air Line, while an alphabet soup of carriers linked the Midwest with the Sunshine State. Unlike the bigger systems, however, such traffic was the 685-mile FEC's bread and butter. In a classic, palm-framed publicity photo from 1939, brand-new FEC E3 No. 1002 strikes a pose with a seven-car *Champion* consist.

Atlantic Coast Line, which extended from Richmond, Va., to Florida's west coast but not the east, was FEC's principal connection to the north. The *Champion* was primarily an ACL endeavor, the leader of a fleet of New York–Florida trains. Like the FEC, the Coast Line was a double-track, high-capacity railroad. On some segments of ACL's generally flat, straight alignment, passenger trains were permitted 100 mph. In common with the FEC's power, the Coast Line's E units wore colorful livery with THE CHAMPION emblazoned on the nose, as seen on E3 No. 500.

ABOVE, SETH BRANSON COLLECTION; BELOW, JONATHAN NELSON COLLECTION

THREE PHOTOS, DAVID W. SALTER

Seaboard Air Line's Richmond–Florida route was inland from ACL's, and thus more curvy and hilly. But while SAL couldn't match its rival's maximum speeds, it could still turn a wheel. The road's top streamliner was the *Silver Meteor*, whose Miami section is pictured in three pan shots speeding south near Coleman, Fla., in April 1964. The E units up front originally wore a green-and-yellow "citrus" livery; the mid-train Sun Lounge featured rooftop windows; and the tavern-lounge-observation contained a room for a train hostess.

Pennsy's *fast track* to the future

A 22-mile segment of PRR main line in New Jersey was a laboratory for the Northeast Corridor and its *Metroliners*

BY **GREG GORMICK**

When a comprehensive history of U.S. high-speed rail passenger service is written, it's a fair bet the bizarre test track that was a key component of this quest for speed will garner some fascinating coverage.

Bizarre? How else would you describe a test track for high-tech, high-speed passenger trains smack in the middle of the busiest intercity rail corridor on the continent? Or one that had to simultaneously host everything from the *Broadway Limited* to heavy drag freights daily?

That's the role played by a strategic section of the fabled New York–Washington main line of the Pennsylvania Railroad under the program that eventually sparked the Budd Company's *Metroliners* to life and paved the way for today's Amtrak *Acelas.* That it succeeded is a testament to the skill and determination of those men of Pennsy who toiled under these less-than-ideal conditions.

The background is long and circuitous, with a multitude of players and events, including:

- W. W. Atterbury, the visionary PRR president whose push for electrification resulted in the launch of faster, all-electric service between New York and Washington in 1935;
- Rhode Island Democratic Sen. Claiborne Pell's enlightened belief that America's love affair with the airplane and the Interstate would burn itself out in the Boston–New York–Washington region and the way to make it "Megalopolis Unbound" was with high-speed rail;
- President Lyndon B. Johnson's unfurling of his Great Society program of 1965 that, at the urging of Sen. Pell, recommended a $20-million study of high-speed service in the Northeast Corridor (NEC);
- PRR's need to design a passenger successor to the aging, 100-mph GG1 electric locomotives then hauling the road's intercity passenger trains under the wires;
- the continuing popularity and profitability of NEC services, even in the face of mounting losses on the remains of PRR's long-haul passenger fleet and inadequate stopgap improvements such as rebuilding 70 sleeping cars into coaches;
- the success of the Budd Company's electric multiple unit (M.U.) Pioneer III cars (later designated Silverliner I), largely developed by

DON WOOD

DOT's four souped-up Silverliner test cars soar through Princeton Junction at nearly 145 mph during a May 24, 1967, demonstration run for officials and the press.

the PRR, delivered for Philadelphia commuter service in 1958 and deployed on Philadelphia–New York weekend specials for the 1964 World's Fair;

• PRR Chairman Stuart Saunders' belief that he could grease the wheels for his cherished merger with the New York Central if he gave the Johnson Administration some high-speed passenger goodies based on his road's 1958 study validating the concept; and

• the headline-making 1964 launch of the Japanese National Railways' 130-mph New Tokaido Line service between Tokyo and Osaka, setting the stage for the global high-speed revolution that continues today.

These and other factors came together in the September 30, 1965, signing of the High-Speed Ground Transportation Research and Development Act, leading to the creation of the Office of High-Speed Ground Transportation within the U.S. Department of Commerce. The plan provided $90 million over three years for the development, testing, and demonstration of United Aircraft's lightweight, passive-tilt TurboTrain for the New Haven Railroad's New York–Boston route and—based on PRR's earlier findings—M.U. cars for the New York–Washington end of the NEC.

The merger-hungry PRR board saddled up with its own investment plan, which would ultimately add another $60 million.

With all the contracts signed by May 1966, it was seemingly off to the high-speed races. The objective was full revenue service at 100 mph within 18 months and an incremental notch-up by 1970 to 160 mph—one click faster than the 159 mph speed record of the New Tokaido.

To call this overly ambitious is an understatement. Consider this: Planning for New Tokaido stretched back to 1940 and construction of the all-new line and equipment required five years.

To pull off this steel-on-steel miracle, PRR formed a special department to work cooperatively with the Department of Commerce and, after its creation on April 1, 1967, the U.S. Department of Transportation (DOT). Bob Watson, a Penn State and Yale graduate—and third-generation Pennsy man—was plucked from his position as Philadelphia Division Master Mechanic to be Coordinator, Northeast Corridor Demonstration Project, although he admits "there were times when it all seemed pretty uncoordinated."

Watson's base was PRR's Morrisville, Pa., enginehouse. Located just across the Delaware River from Trenton, N.J., it was normally the domain of freight diesels and electrics. His first task was to undertake the $3.9-million test program using four jazzed-up Silverliners purchased by the Commerce Department and heavily instrumented by Westinghouse Air Brake's subsidiary, Melpar, under Operation High-Step.

With the DOT's Pueblo, Colo., test facility still years away, PRR and consultant Louis T. Klauder & Associates selected the 21.9-mile stretch of Track 3 of the "Broad Way" between the block towers at County (New Brunswick, N.J.) and Millham (Trenton) as the site of the high-speed laboratory. The outside tracks, 1 and 4, were the eastbound and westbound local passenger

G. N. LANDAU; KRAMBLES-PETERSON ARCHIVE

In August 1967, the DOT research cars cool their heels between test runs at PRR's Morrisville, Pa., freight-engine terminal, the base for the Corridor test program.

FRANK B. JAQUETTE JR.

Fresh from the Budd plant, the brand-new test cars stand on Reading track at Jenkintown, Pa., on July 10, 1966. Streamlined cowls were later applied to cars T-1 and T-3, and the Department of Commerce seals and lettering were replaced by DOT markings.

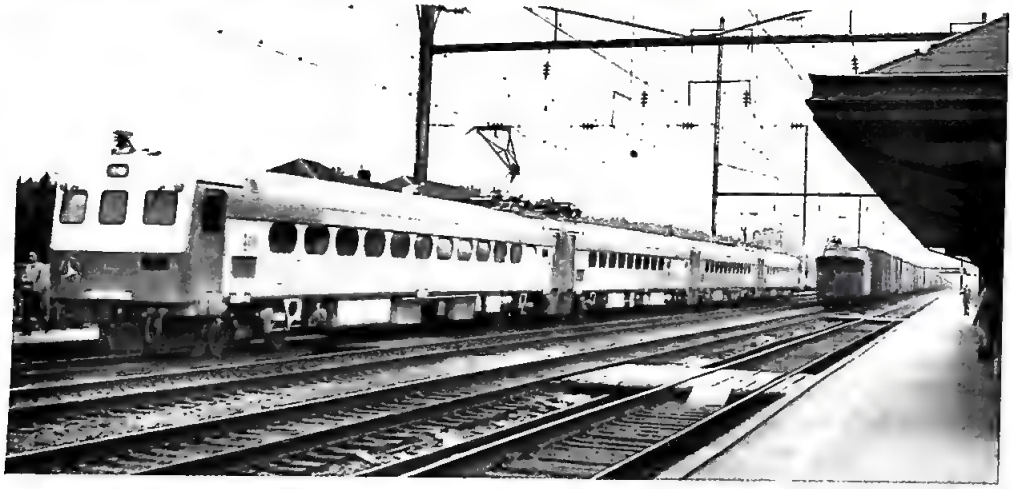
JIM SHAUGHNESSY

A GG1 wheels a westbound passenger train through Princeton Junction on February 9, 1959; nine years later, tests for the motors' intended replacements would occur here.

mains, respectively. Track 3 was the westbound freight and through passenger line; Track 2 was its eastbound counterpart.

"We were creating a high-speed racetrack down the middle of a busy, working railroad," says Watson. "As unlikely as it seems, it proved to be a wise move."

Even though it would have to continue in its freight role throughout the testing and on into commercial service, this location was viewed as ideal largely because of geography and geometry. Track 3 had previously received some upgrading, including the early installation of welded rail and reverse signaling. More important, it was free of grade crossings, sloped gently downward to the west, and was encumbered by only one mild grade west of Princeton Junction, the only passenger station in the 21.9 miles. It was also the longest tangent in a rural setting on the entire NEC, with a



TWO PHOTOS, DON WOOD

An E44-powered freight lumbers westward through Princeton Junction on Track 3—the track on which the high-speed tests were run—as the DOT cars pull into the station on an eastbound positioning move.

single curve at Milepost 41, west of Monmouth Junction, through which the test train would still be accelerating as it raced toward Trenton. Speed test runs would be conducted in the westward direction only.

The PRR test track proved its worth even before it was fully prepared. When test cars T-1 through T-4 were completed by Budd in July 1966, they were operated briefly on the Reading Company's fast, double-track West Trenton Branch near Jenkintown, Pa. Their pantographs promptly snagged the catenary and brought the wires down, thus ending serious testing until the PRR proving grounds were ready in November of that year.

When the cars finally met the completed test track, they encountered what was undoubtedly North America's finest and most scientifically engineered piece of railroad, physically reshaped by Philadelphia Division Assistant Engineer Charlie Gaut's track forces and traction power crews. It consisted of new 140-lb. continuous welded rail from Bethlehem Steel's Steelton, Pa., rolling mills spiked to oak ties on a roadbed with a 12-inch cinder subgrade and 12 to 18 inches of crushed rock ballast. Heavier, oval-grooved catenary went up to improve pantograph shoe contact.

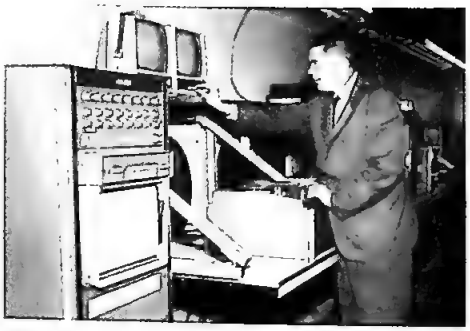
On test runs, the four-car train would leave its stable at Morrisville and gallop east on Track 2 at up to 100 mph to reach its starting gate at County. There, it would be crossed over the main and held at the west end of New Brunswick Yard awaiting a track slot.

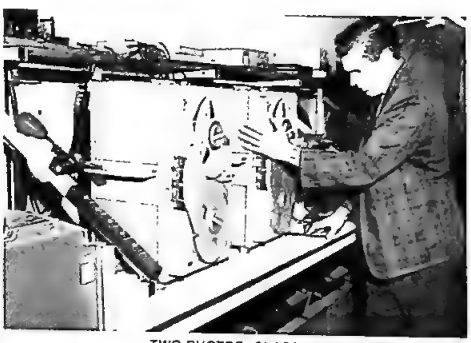
Says Watson, "The New York Division dispatchers were very good to us, working to free up track time in the midst of all they had to contend with to keep the railroad moving. Up to 100 mph, we weren't much of a problem, but we originally required all tracks cleared for anything faster. We preferred to do our testing in daylight hours when we could see what was going on and, of course, that put us into peak traffic periods."

When the dispatchers had a window cleared, they'd tell the test crew to go and they'd come out of the yard at 15 mph, cross over to Track 3 and see those distinctive PRR position-light signals all lit straight up clear through to Millham. Watson says the special duty engineman would just open the controller and go. Unfailingly cooperative though they were, the dispatchers were always delighted when the train hit the end of the test track and they could get the corridor flowing again.

DON WOOD

Though he wouldn't dare do so at speed, special duty engineman Elton B. Selover leans out his window for newsmen at Princeton Junction during the May 24, 1967, press event.





TWO PHOTOS, CLASSIC TRAINS COLLECTION

The DOT M.U. cars looked like a modern commuter train from the outside, but inside they carried test apparatus, not seats. At top, a field engineer adjusts a video monitor. Above, a colleague loads tape into an Ampex FR-1300 seven-track recorder.

"I have to admit it was thrilling," says Watson. "None of us had moved at this speed on rails before. But there could also be times when it got a bit scary."

That would be when the tests revealed certain critical flaws. The most serious was a traction motor suspension defect that could have dropped the 156 h.p. GE motors on the tracks and led to a serious derailment. Fortunately, it didn't, although it suspended the already short testing program for several weeks.

Another perplexing problem was wheel-flange gouging. This proved to be almost humorous when the cause was finally attributed not to any of the high-speed running but to a loose switch frog on one of the Morrisville shop tracks.

The test track proved most valuable in what it revealed about the relationship of the pantographs to the variable-tension catenary at high speeds. The four test cars were designed to operate with all their pans up, but this proved problematic.

"This was one of the bigger unknowns that we faced and we recognized it could be trouble," says Watson. "The catenary could sag or tighten according to the weather and there was no way of knowing what would happen with multiple pantographs pushing at the trolley wire at those speeds. We eventually equipped the cars with bus jumpers so we could run with just one pan up."

Another critical finding was in the area of stability and speed related to drag and air turbulence. In sleuthing out every impediment to hitting the 160-mph objective, the aerodynamic characteristics of the cars came under the microscope. This resulted in the addition of sculpted cowls on cars T-1 and T-3, similar to what was going onto the *Metroliners*, already under construction at Budd. Cowling for the single-arm Faiveley pantographs was also designed, but never implemented.

"The biggest problem," recalls Watson, "was that we were not working with true high-speed cars, but really only Silverliners with a modified gear ratio. We tried every trick to out-Japanese the Japanese. We ran night tests, when there wasn't as much traffic out there to drag down the catenary voltage. We even added a rotary frequency changer as a booster at Metuchen and jacked the catenary voltage up from 11,000 volts to nearly 13,000."

The specter of Japanese supremacy took a humorous turn when Dr. Hideo Shima, chief engineer of JNR's New Tokaido project, paid a visit. Watson chuckles when he recalls that Shima was so polite to the rabidly nationalistic government and railroad officials, but shook his head in disbelief when he was alone with the railroaders. He couldn't fathom how the project could be pulled off under such restricting conditions and in so little time. Yet, the PRR team did acquit itself admirably in the face of these daunting challenges.

The test train finally hit the contractually required 155-mph mark on the night of April 1, 1967—coincidentally the birth date of the DOT.

Now, high-speed rail was ready to tentatively meet its public. On May 24, 1967, the four-car test train carried a payload of government officials, railroad brass, and members of the press to County. The special began rolling west at 10:38½ a.m. Ten minutes later, the speedometer in a vestibule of car T-1 said it all: 156 mph.

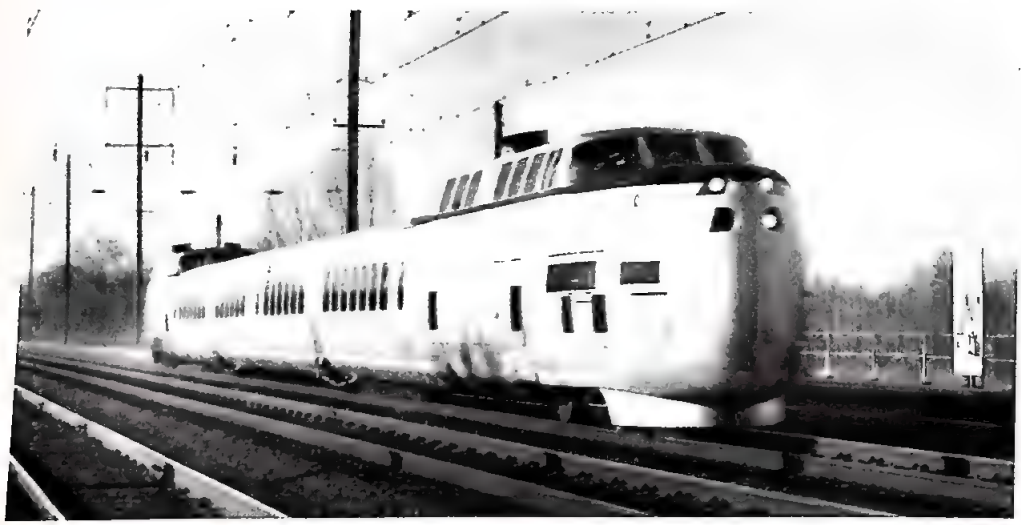
Although the 160-mph barrier wouldn't be broken with the test cars, it was an impressive performance for a clutch of Silverliners running on an alignment staked out more than a century before in a land that had once nurtured, but now underfed, its iron horses.

While this and other accomplishments were being chalked up out on that test track, events were moving swiftly—if not smoothly—elsewhere. The *Metroliners* were taking shape shakily over at Budd's Red Lion plant in Philadelphia and the United

BUDD CO.· LAWRENCE S. WILLIAMS

BUDD CO.

A scale model (top) shows the distinctive, rounded form of the *Metroliners*, which were under construction at Budd (above) even as the DOT cars were testing on the Northeast Corridor. Budd used the same carbody design in its Amfleet cars of the 1970's.



UNITED AIRCRAFT

United Aircraft's TurboTrain arrived for Corridor testing in December 1967, right after the first *Metroliners*. Although the Turbos had limited success in the U.S., the DOT's three-car test set (pictured eastbound on Track 3 at Princeton Junction) hit 170.8 mph.

Aircraft/Pullman-Standard consortium was delivering its TurboTrains for New York–Boston service on the sinuous and bankrupt New Haven.

Watson points out, "With all that we had on our plates, we really didn't need a visit from the Turbo. But they, too, had to hit 160 mph to meet the terms of the DOT contract and there was no equivalent test track on the New Haven. It came to Morrisville on December 5, 1967, shortly after the first Westinghouse-equipped Metroliners arrived. This was, of course, just a few weeks after the planned revenue service launch of October 1 had been missed."

Hard-luck train that it later proved to be, the Turbo performed well on the PRR test track and attained 170.8 mph on December 20. The *Metroliners* didn't fare nearly so well, although the first pair did reach 160 mph on the evening of December 15.

Says Watson, "The DOT test cars and the *Metroliners* were two entirely different trains. There were all sorts of complications, many relating to the division of the contract for the propulsion gear between

W. C. JANSSEN PHOTO; KRAMBLES-PETERSON ARCHIVE

May 21, 1968, finds several *Metroliner* cars at the Reading's Wayne Junction M.U. yard in Philadelphia. Some testing occurred on the RDG before the cars went to the NEC.

General Electric and Westinghouse. Our job was to receive them via the Reading interchange at North Philadelphia, break them in on the test track and then get them to hit 160 and operate reliably. Ha, ha."

Intended pride of the United States as the would-be usurper of the Japanese speed crown, the *Metroliners* demonstrated their flaws publicly on the test track. Rail photographers attuned to the Pennsy grapevine were there to record every grisly failure. Yet, the test track was still reliably fulfilling its function as the proving (or disproving) grounds.

Even after *Metroliner* revenue service finally began with only a small slice of the 61-car fleet on January 16, 1969, the test track hummed intensely as the crews were driven to push the cars through their paces. Morrisville Yard became plugged with *Metroliners* as the railroaders—now employees of the merged Penn Central and glad to have some solid support from consulting firms such as Gibbs & Hill—strove to make them perform.

"To be fair, they were trying to do too much too fast," says Watson. "When it was all said and done, we did eventually get the *Metroliners* up to a reasonable level of reliability and they did bring some decent service to the corridor."

In 1972, Watson left the railroad when the atmosphere within the bankrupt PC soured, driving many fine people away. He accepted a previous offer to join Lou Klauder's firm as a senior engineer. Ironically, Watson wound up continuing his association with the NEC project through the consultant's ongoing contract with the DOT's Federal Railroad Administration.

Looking back on it all—the challenges, the headaches, and the accomplishments—Watson is still most pleased by the fact that there wasn't a single accident during the whole program. The only injury was a sprained ankle experienced by a worker in one of the pits at the Morrisville enginehouse, although he adds that the test trains did claim "a few dogs and some deer, not to mention clearing out part of the pigeon population of the Northeast."

Today, the role of the NEC test track has been largely superceded by the Transportation Technology Center's facilities in Pueblo. Still, the original will not fade away.

Says Watson, "They may have done most of the heavy testing of the *Acela* at Pueblo and some north of New Haven, but they also used our test track because of its geographic attributes. I think it has proved to be worth every penny spent on it in the 1960's and I'm sure it will have some role in the testing of future generations of high-speed equipment."

It is a somewhat similar combination of history, geography, and ongoing utility that earned Route 66 its title as the Mother Road of the U.S. highway system. One would have to say those factors qualify the 21.9 miles from County to Millham on Amtrak's NEC for the same veneration in the saga of fast trains on American rails. ■

Speed Bursts

Saving time by not stopping

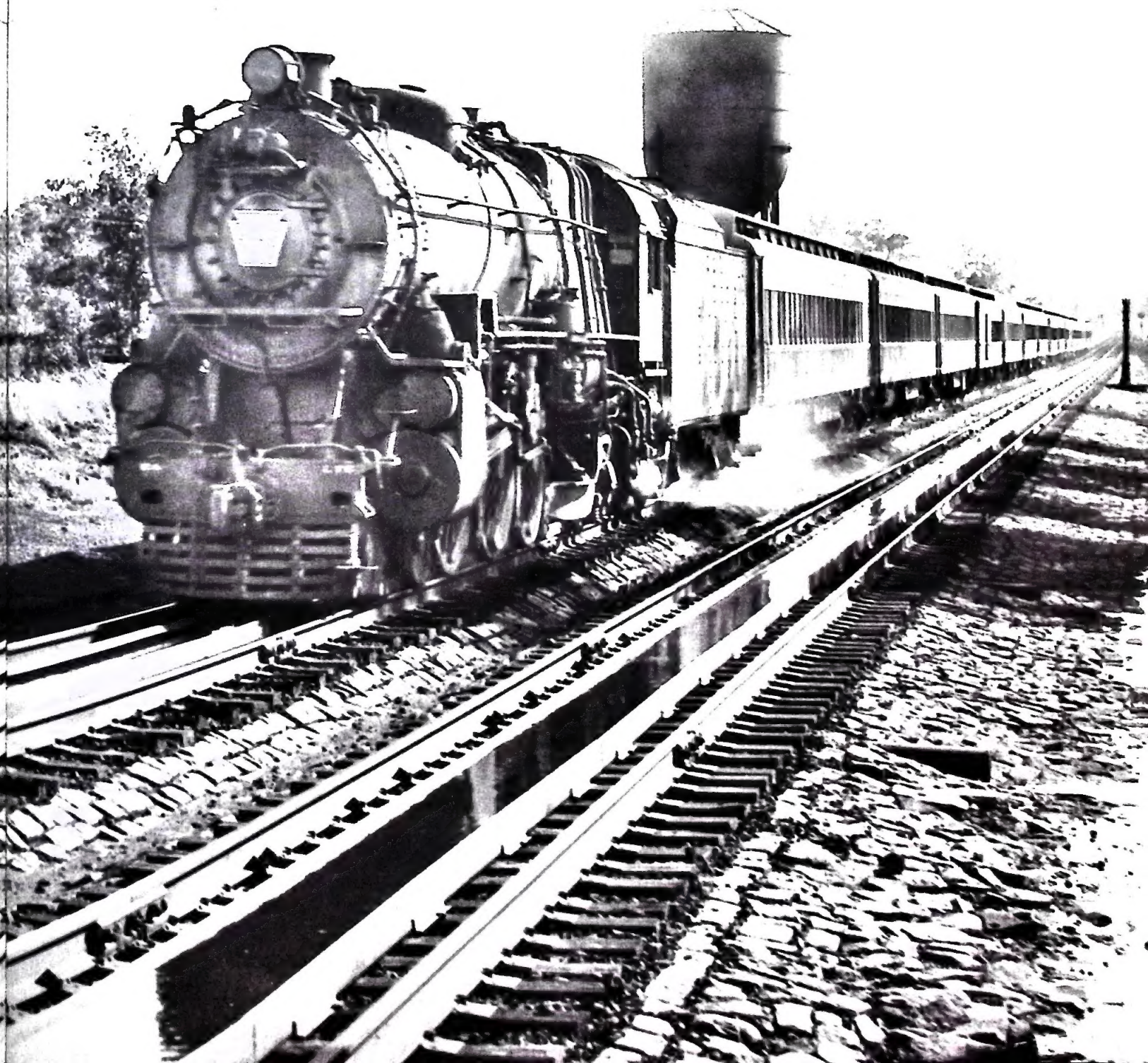
DONALD SIMS

Orders on the fly: A crewman on a Milwaukee Road Little Joe electric prepares to snag train orders at Butte, Mont., in the early 1960's. The lower "fork" holds orders for the caboose crew.

A. C. KALMBACH

Nonstop mail exchange: Somewhere on the NYC, a Railway Post Office clerk catches a mail pouch as his train thunders past a station; moments before, he would have kicked out a pouch of local mail.

Scooping water: Stopping for water was a time-consuming fact of life in the steam era. But on a handful of high-density, speed-critical lines, scoop-equipped locomotives could—without stopping—slake their thirst at water troughs ("track pans") between the rails. On September 6, 1953, PRR K4s 5495 demonstrates with a westbound train at Ancora, N.J., on the Pennsylvania-Reading Seashore Lines.
R. L. LONG



Towers in St. Louis

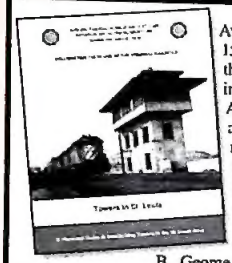


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Photo by Tom Danneman

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TurboTrain

NORTH AMERICA'S FASTEST TRAIN

The 1960s saw the introduction of the United Aircraft Corporation/Pratt & Whitney Canada TurboTrain. A brainchild of the gifted Alan Cripe, the TurboTrain was an application of modern aircraft technology to a high-speed train. Powered by jet turbines, it was designed to attain high speeds on conventional track, and it overwhelmingly achieved that goal. On December 20, 1967, the TurboTrain raced its way to 170.8 MPH, setting the American rail speed record for a production train. This record still stands today. On April 22, 1976, the TurboTrain achieved the Canadian speed record of 140.6 MPH, also unbroken to this day. For over 40 years, the TurboTrain has been, and continues to be, the fastest production train in North American history.

Rushed into service after only a year of testing, the TurboTrain had a rocky beginning, earning it an undeserved reputation as a failed experiment. However, the TurboTrain's history did not end there. In 1972-1973, the Canadian trains were completely rebuilt by Pratt & Whitney Canada. They went on to become the most reliable trains in Canada, with 97% on-time performance and 98.6% availability. The Turbo experiment was, in the end, an astounding success.

Unfortunately, external factors killed the project, and no more TurboTrains were built. All were scrapped in the 1980s. Not a single train remained... until now.

After four years of development, Rapido Trains Inc. is pleased to finally deliver the only true scale model of the TurboTrain. This exquisite HO scale model features accurate details from the inside out for each unique prototype; real TurboTrain sounds sampled from rare video footage; Canadian and American station announcements; constant interior lighting; directional headlights and Gyralites; flush, tinted windows; full-width, operating rubber diaphragms; and a complimentary copy of *TurboTrain: A Journey* by Jason Shron. Additional Intermediate Cars (TurboCoach, TurboClub and TurboCafe) are available separately to make every complete and prototypical train.

The TurboTrain would make a notable addition to any display case, mantle or HO scale model railroad. Not in the market for a scale model train? *TurboTrain: A Journey* by Jason Shron is available separately from railroad booksellers and hobby shops in the United States and major book stores and hobby shops in Canada. This 136-page book is the first to tell the story about this amazing train, complete with over 200 photographs.

The TurboTrain was an important part of North America's railway heritage. Keep its legacy alive with the Rapido Trains Inc. HO scale TurboTrain.

Available now wherever fine model trains are sold.

TurboTrain. Part Passenger Train. Part Jet Aircraft.

New Haven/US DOT. Penn Central (shown). Early Amtrak. Late Amtrak. Canadian National. VIA Rail Canada.

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